

The Mining Journal

Established 1835

Vol. CCXXXVI No. 6041

LONDON, JUNE 1, 1951

Railway & Commercial Gazette

PRICE 2d

At your service for—
MINING MACHINERY
 AIR COMPRESSORS · BOILERS
 CRANES · LOCOS · PUMPS
 All the Plant needs of Industry.
 Send us your enquiries.
 East Parade,
 Sheffield, 1.
 Tel. No. 25032
E. SIMM
 MACHINERY LTD.

BOILERS PUMPS
 COMPRESSORS DUMPERS EXCAVATORS

"HUNSLET"
LOCOMOTIVES
STEAM & DIESEL
SPECIAL DIESELS
 FOR
UNDERGROUND WORKING
 THE HUNSLET ENGINE CO. LTD.
 LEEDS 10

CONCENTRATION of MINERALS by Modern Methods

TUNGSTEN · TIN · CHROMIUM
NIOBIUM · TITANIUM
BASE METALS · RARE EARTHS
 ETC. ETC.

HIGHEST EFFICIENCY
 - LOWEST COSTS

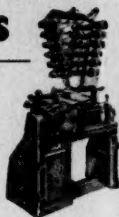
CONCENTRATING TABLES
 MAGNETIC SEPARATORS
 SCREENING PLANTS

DAVIES MAGNET WORKS LTD.
 WARE HERTFORDSHIRE Telephone: WARE 48

M.J.74

DOUGLAS

& MACADIE



We will be pleased to
 furnish illustrations
 and specifications of
 suitable machines on
 receipt of details of
 your coil-winding
 requirements.

Automatic COIL WINDING MACHINES

There is a complete range of these Coil Winding Machines to cover every requirement, and several are eminently suitable for the rewinding or winding

of replacement coils in the field. Easy operation and speedy results are obtainable by comparatively unskilled labour.

Sole Proprietors and Manufacturers:

The AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO. LTD.
 WINDER HOUSE · DOUGLAS STREET · LONDON · S.W.1 Telephone: VICTORIA 3404/8

THE BIRTLEY COMPANY LTD.

PIONEERS of

Pneumatic Coal Preparation Plant.
 Builder of over 100 installations.

MANUFACTURERS of

The New Tromp heavy medium system, Rheo-France automatic Rheolaveur and K & B Flotation Equipments.

Market Place Chambers, West Bars, Chesterfield
 Phone: Chesterfield 4116 (3 lines)

Do you want a second opinion?

The first issue of The Nickel Bulletin was sent out 21 years ago. Ever since, month after month, it has found its way to the desks of metallurgists, chemists, engineers, works managers and many others concerned with the production or use of metal. Its abstracts of current published information provide a valuable second opinion whenever nickel and its alloys are being considered. You can have the Nickel Bulletin constantly at your elbow by asking to be put on the mailing list now. There is no charge.



THE MOND NICKEL COMPANY LIMITED • SUNDERLAND HOUSE • CURZON STREET • LONDON • W.1



*Merchants and
Exporters*

WOLVERHAMPTON

DIAMOND DISC
& TOOL CO. LTD.

ALL KINDS OF
BOARDS AND INDUSTRIAL
DIAMONDS

11, HATTON GARDEN
LONDON E.C.1

TELEPHONE • HOLBORN 3917 CABLES • PARDIMON LONDON

A New Book on

THE WITWATERSRAND GOLD MINES

307 Pages featuring:

49 MINING COMPANIES

complete with tables, graphs and map and
an abundance of useful information for the

INVESTOR

STOCKBROKER

FINANCIER

MINING ENGINEER

STATISTICIAN

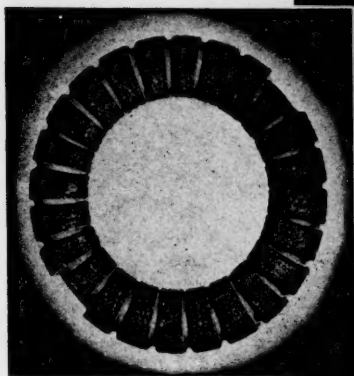
PRICE 25s. FINANCIAL JOURNALIST

To

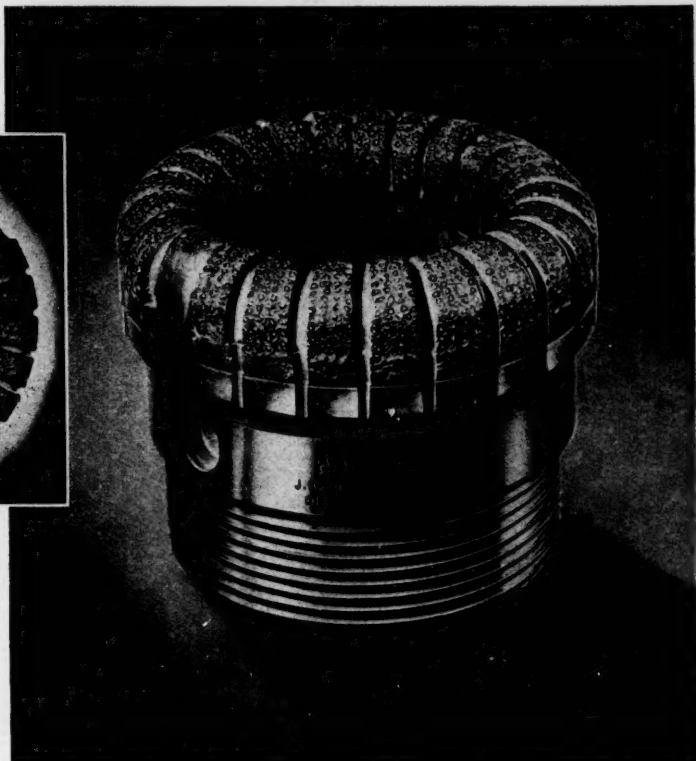
THE INVESTORS CHRONICLE, 11 Grocers Hall Court, E.C.2
Please supply.....copies of "THE WITWATERSRAND GOLD
MINES" and receive Cheque/Postal Order for £.....

NAME

ADDRESS



Side and plan view of
Diamond Oil Well Hardhead
Bit by Smit



Diamond Oil Well Bits

that help to better faster drilling

It is significant that the best and most experienced men in any form of mining demand the best of tools. That gives intense significance to the fact that Smit's have gained a position of unquestionable leadership in the design, manufacture and supply of drilling bits for the oil industry as well as for other forms of mining. Smit's pioneered the introduction of bortz for diamond drilling into the United States of America and Canada

over 20 years ago. Just as they were the first to introduce modern practice, so they lead to-day in every development of the principle they evolved. Nearly every problem of oil well drilling can be met from the range of standard bits made by the firm.

Whenever some exceptional problem crops up then the bit that will meet it efficiently is evolved for that special purpose. The right diamonds

in the right matrix in the right design of bit for those particular conditions. That's how Smit's work. Your problem is theirs, for in the correct solution lies your profit and the justification of your future business with Smit's.



Telephone: ABBey 7473-4 and 3042

J. K. Smit & Sons Ltd.

Head Office: 57/59 Victoria Street, London, S.W.1
also at Manchester — 2, St. John's Street, (Telephone: Blackfriars 0443)
& Coventry—Holyhead Chambers (Tel. Coventry 5215) Works: Colwyn Bay (Phone: 2062)

Call, write,
'phone, or
wire to:—



MALAYA HOUSE

for information and advice regarding Trade,
Industry, Production and general conditions in

57
TRAFALGAR
SQUARE
LONDON, W.C.2

Telegrams:
MALAWAKIL,
LONDON

Telephone:
WHITEHALL
9837

SINGAPORE
AND THE FEDERATION OF
MALAYA



BREATHING APPARATUS

of all British
manufacture

by the Original Designers and largest manufacturers who have supplied Mines Rescue Brigades, the Fire Service, etc. for many years.

"PROTO"
"LUNGOVOX"
"SALVUS"
"FIREOX"
Oxygen Types

also Compressed Air Apparatus

Smoke Helmets Gas Masks, Dust Respirators, Resuscitation Apparatus for asphyxia, electric shock, etc. Protective Clothing, Goggles, etc., Diving Apparatus.

Established 1819

SIEBE, GORMAN & CO. LTD.
LONDON
EVERYTHING FOR SAFETY EVERYWHERE

TOLWORTH, SURBITON, SURREY

Telephone: Elmbridge 5900

Telegrams: Siebe Surbiton

Men who get down to the job . . .

. . . need a boot that will stand up to the test. The protective qualities of TOTECTORS make them increasingly popular in mine and factory. The external steel toe cap will withstand a pressure of three tons giving miners and industrial workers full protection and extra wear.

Safety and Welfare Officers should write for full particulars.



TOTECTORS

SAFETY BOOTS

AND SHOES

WILKINS & DENTON (LONDON) LTD Granville Square, London, W.C.1

We welcome Home and Overseas visitors to our London showrooms 52 Woburn Place, W.C.1

*FLINT, next to DIAMOND,
is the HARDEST
MATERIAL KNOWN—*

*—and this B.T.R
Long-Life Belt
has carried it for
ELEVEN YEARS*

Flint Gravel Belt at the
Uxbridge Flint Brick Co. Ltd. Cowley Nr. Uxbridge.

B.T.R.



BRITISH TYRE & RUBBER CO. LTD.
Herga House · Vincent Square · London, S.W.1.
Telephone: VICTORIA 3848 Telegrams: BRITGOODS, TELEX, LONDON.



have you
seen this
VICTOR
DRILL in
action?

Wherever you need a 50 cycle Drill,
this **VICTOR** model gives more
power and cuts operator fatigue

DESIGNED, like all Victor Mining Equipment, to give a high power/weight ratio, this 50 cycle drill is extremely light in weight and is fitted with a powerful motor, which has variable speeds for coal or stone work. For stone work the drill is fitted with lugs for use with force feed mechanism.

Both mechanical and electrical systems are easy to maintain, and all spare parts are interchangeable.

**A DEMONSTRATION CAN BE
ARRANGED**

at some time to suit you, when you will have the opportunity to see the Victor 50 Cycle Mining Drill working under normal conditions. A line from you and we shall be happy to fix things up. Why not write us today?



Used throughout the World

The Mining Journal

Established 1835

Vol. CCXXXVI No. 6041

LONDON, JUNE 1, 1951

PRICE 8d

EDITORIAL and ADVERTISING ENQUIRIES TO:

15 GEORGE STREET,
MANSHION HOUSE
LONDON, E.C.4

Tel. Nos.: MANSHION HOUSE 5511 & 9182

SUBSCRIPTION RATES:

(Including Postage)

INLAND:	10s. ... 3 months,
	18s. ... 6 "
	32s. ... 12 "
ABROAD:	40s. ... 12 "

THIS WEEK'S FEATURES

RETROSPECT AND REMINISCENCE	- Page 527
GALLIUM—A BY-PRODUCT METAL	- Page 528
IRON AND MANGANESE IN BRAZIL	- Page 531

NOTES AND COMMENTS

Revival of Cornish Mining Industry in Sight?

The untiring efforts of the Cornish Mining Development Association in the last decade to arouse Government interest in reviving the British non-ferrous mining industry, and in particular the further exploitation of the un-mined mineral reserves in Cornwall has so far met with little success.

In recent years perhaps the greatest disappointment has been the failure of the Government to implement the recommendations contained in the Westwood Mineral Development Committee's report which appeared in 1949. Nor does the belated assistance given to South Crofty and the recent decision to re-open the Hemerdon low grade wolfram-tin mine near Plymouth vitiate this statement. It was only after the Cornish pump broke down at Crofty, a prediction made by the Government's own committee, that the Government took positive steps to assist the mine. The re-opening of the Hemerdon mine was also born of necessity. For it was not until a combination of a shortage of supply and high prices for wolfram prevailed that the Government turned its attention to the possibilities of rining the Hemerdon deposits. These piecemeal decisions can hardly be described under the name of a policy.

Undeterred, however, by the lack of Government co-operation the Cornish Mining Development Association, at its recent annual meeting, revealed that it had made a direct approach to the Organization for European Economic Co-operation (O.E.E.C.). At the meeting Mr. J. H. Trounson, the retiring chairman, referred to Mr. E. D. Linton's recent visit to Cornwall on behalf of the O.E.E.C., and it appears that Mr. Linton was greatly impressed by what he had seen and heard. So much so that he is reported as having proposed that a leading American economic geologist, Dr. Max Short, should be officially sponsored in his forthcoming visit to Cornwall.

When Mr. Linton visited Cornwall he had before him the excellent memorandum by Mr. J. H. Trounson entitled "Mineral Areas in Cornwall Worthy of Investigation," a summary of which appeared in *The Mining Journal* of February 23, 1951, on page 171. Of the twenty-three major schemes outlined in this memorandum eight were selected for further discussion in Washington.

The Association has followed up its overture to the O.E.E.C. by again asking the Government to receive a

deputation to discuss a long-term policy for mineral development in Cornwall. At the time of going to press it is not known whether a conference on this matter will take place.

Should the Association's request for a conference receive favourable consideration from Whitehall, a memorandum prepared by the Association's Mining Taxation Sub-Committee would form part of the Association's case. This memorandum will set out what particular changes are necessary to attract private enterprise to develop the Cornish mining industry.

Further, the Association has told Mr. R. R. Stokes, the Lord Privy Seal, who is now in charge of the acquisition of raw materials, that it would be pleased to appoint representatives, if necessary, to accompany him on any tour he might take for the purpose of evaluating the contribution Cornwall could make in easing the shortage of certain raw materials.

By these moves the Association would appear to have manoeuvred itself into the position of forcing the Government to declare its intentions concerning the future of the Cornish mining industry. The Association has an arguable case to support its view that an enlightened long-term policy for mineral development in Cornwall can only prove to be of benefit to the whole of Great Britain.

A Realistic Picture of the Tin Outlook

The annual speech of the chairman of the Straits Trading Company, the latest of which is reported in another column, is always an important pronouncement for the tin industry, and it is especially so now when, as he remarks, so much is being said which verges on the irresponsible. There is always apt to be acute difference of opinion between those whose interests lie on the production side and those who regard the matter as consumers. In this respect the smelter represents largely independent opinion. He is interested primarily in quantity and not in price; the larger the amount of ore reaching him for production the lower he can set his returning charges in view of the greater tonnage over which costs can be spread. Mr. Fergusson has not only a long experience of the tin industry in the East but has acted as technical advisor to the British Delegation at recent tin conferences and more particularly at the Washington Conference last March. This enables him

to speak with assurance of the fundamental desire of the American authorities to be friendly and helpful in their general attitude towards the industry, and should help to allay the irritation which has undoubtedly been aroused in Malaya by the quite unjustified charges that the Eastern producers have been gouging America.

There can be little doubt that it is the stockpile buying policy, initiated after the war in the United States, which consumers and governments elsewhere have been inevitably forced to imitate more recently, that has been primarily responsible for the immense increase in prices though it is an increase which has not been out of balance with advances in other metals and commodities and which incidentally has resulted in tin being more plentiful in the United States than any other industrial metal.

This leads us to the consideration which is of most importance if only from a short term point of view to the tin miner of to-day. What is going to be the policy of the United States administration as a sole buyer of tin for the world's greatest consumer, and how long can their abstention continue without a reduction in the world's price? Incidentally the situation is not unlike that which developed at the end of the first World War when excessive stocks led to an embargo on imports until the excess had been corrected. A drastic fall in prices followed by feverish fluctuations leading eventually to the international tin restriction experiment was the outcome then. We have on various occasions pointed out that the United States had not ceased to absorb tin through its continuing contracts with Bolivia, Belgium and Indonesia, despite the cessation of regular purchases in the open market. The figure mentioned by Mr. Fergusson—50,000 tons—is larger than has been generally assumed and should make the United States independent as concerns market purchases for a long time to come, allied as it is with a big existing stock.

Mr. Fergusson points out that last year's output of some 165,000 tons of metal should more than suffice over a trade cycle to meet world needs especially as the corresponding figure for consumption he places at 150,000 tons. The question naturally suggests itself, will this output be maintained? It is impossible to give an answer unless we know what prices are likely to be in the future. He confirms the report by our Malayan correspondent that the Chinese mining community—responsible for more than 40 per cent. of the Malayan output—do not regard the present price as unjustified by their present overall costs, and though the European companies, working largely through dredges may be more favourably situated they are more hit by taxation and in any case are steadily exhausting their reserves of stanniferous ground and according to some authorities being forced to work lower grade ore and that not merely because of the natural desire to conserve higher grade yardage to sweeten returns should prices fall. So far this year Malayan returns are about 500 tons down and those from Indonesia also slightly lower. Bolivia has been a declining quantity for a considerable number of years with their highest returns in 1929. No new mines have been reported for many years and there too a decline in grade is also apparent. Anyway the fact remains that the immense increase in prices last year seems to have spent its force as a factor of increased production, and in the long run few will disagree with Mr. Fergusson that the present trend of events indicates a gradual drop in world output in the long run.

This brings us to the conclusion which we have so long expressed that with the efficient functioning of the tin industry greatly increased efforts must be made to find fresh sources of supply, whether in to-day's chief

producing countries or elsewhere. While there may not be any acute emergency, it will be years before fresh worth-while deposits can be located, proved and equipped.

Italy's Coal Output

After the loss of the Istrian coalfields to Yugoslavia, most of the coal mined in Italy now comes from Sardinia, i.e., from the Sulcis region in the southwesternmost part of the island, writes a correspondent. In 1949, Italy's coal output at Sulcis totalled 1,014,086 tonnes compared with 861,713 tonnes in 1948, and 465,772 tonnes in 1938, but 1950 brought a decrease as against 1949. The rationalization and modernization of the coal mines and plants now in hand is, however, expected to result in a considerable increase in output for the current year.

Brown coal, originally mostly from Tuscany, was equally on the decline in 1950, when the total mined was 218,099 tonnes, as against 227,538 tonnes in 1949, but was considerably higher than pre-war (168,767 tonnes in 1938). A similar development has been recorded for lignite with the 1950 output down to 562,154 tonnes, contrasting with 604,700 tonnes in 1949 and with 1,410,403 tonnes in 1947 (704,183 tonnes in 1938). In 1947, of course, Italy had to make do with whatever fuel could be obtained, a state of affairs no longer existing, and the drop, in 1950, has perhaps been accentuated by the notable expansion in the use of methane obtained from the rich deposits in northern Italy.

A Tradition is Maintained

On Friday of last week, the directors and staff of *The Mining Journal* celebrated three notable anniversaries. This month, Mr. E. Baliol Scott will have been Editor of *The Mining Journal* for 50 years. Mr. F. V. Walters, widely known as our City advertising representative, also completes 50 years with the Journal this year, while Mr. E. S. Hooper, familiar to trade advertisers both in London and the provinces as our representative, has now been with us for 21 years. Out of a total office staff of twelve, this is a really remarkable record of long service in which directors and staff alike take considerable pride. *The Mining Journal*, which itself has the distinction of being the oldest technical journal in the world, has always had a tradition of long service—in all its 116 years there have been only seven Editors—and we feel sure that our many friends at home and overseas will join with us in congratulating those who to-day are so emphatically maintaining this tradition.

In an article on the facing page, the Editor recalls some of the changes in the mining industry which he has witnessed during his term as Editor.

Mr. Walters, who joined the staff in 1901, became the Editor's personal assistant in 1915, a position he combined with reporting duties until 1929, when he became the Journal's City advertising representative, an appointment which he still holds to-day. He has been a member of the Institute of Journalists for the past 15 years. Throughout his life Mr. Walters has been a keen organizer and for many years played regularly at the week-day service at St. John's, Walbrook, until this old church was wrecked in the blitz.

Mr. Hooper, who joined the staff in 1929, was for a number of years before the war responsible for advertisement production. Subsequently, in 1938 he was appointed accountant and company secretary, a position which he occupied until the war. He served in the Artillery from 1940 to 1946, mostly in West Africa with the Royal West African Frontier Force. On his return to civilian life, Mr. Hooper became our provincial advertising representative, and to-day is well known to our advertisers both in London and the provinces.

Retrospect and Reminiscence

By the Editor

To have presided over the fortunes of the world's oldest mining newspaper for 50 years is a matter of pride and satisfaction to the Editor. With such unique experience readers might expect that out of a treasure house of knowledge he would constantly produce things new and old. But the truth is that conditions are always changing and conclusions which in years gone by would have seemed obvious and incontestable now have to be fitted to new environments and conceptions economic and political.

Inevitably we all live in the present. Scanning a period of 50 years somewhat resembles perusing an historical resumé in which certain features stand out sharply in the memory, but the atmosphere surrounding them when they occurred is distorted or lost.

What vicissitudes and struggles have we witnessed during the five reigns of the first half of a century which has embraced two world wars that threatened the overthrow of our nation, to say nothing of the closing stages of the South African war! This span of time has witnessed the fall of the dynasties of the Hohenzollerns, the Wittelsbachs, the Romanovs, of the House of Savoy, the Ottoman Empire, the Spanish and Portuguese Monarchies; the creation of the Australian Commonwealth—which also is celebrating its jubilee—to say nothing of the redrawing of the map of Europe with the emergence of the Muscovite colossus bestriding two continents, while in the last days, the passing of our Indian Empire, the rise of Canada as a power with limitless possibilities and the emergence of the British Commonwealth of Nations, and finally, and perhaps most momentous feature of all, the advance of the United Nations of America to a pinnacle of material wealth and power unequalled in history.

With these vast changes in the political configuration of the World, and largely contributing to them, has been an almost continuous revolution in material conditions, technical and industrial achievement, and social and economic consciousness. Nowhere has the advance been so marked as in the Science and Art of Mining and we see the world to-day forced to recognize the primary importance of the products of the mineral industry for its regular functioning—nay for its very existence. More than ever, the motto chosen for *The Mining Journal* by our founder and first Editor, Henry English, *effodiuntur opes*, which may be freely rendered "Riches come from the mines," has been justified.

In fifty years it is inevitable that the leading personali-

Mr. Edward Bahiol Scott, Editor of THE MINING JOURNAL since 1901, was born in Sydney, N.S.W., on June 17, 1873. He is the son of Captain Lawrence Hartshorne Scott of the 11th Regiment (Devonshires), A.D.C. to Sir William Dennison (the then Governor of New South Wales), and of Rebecca Bettington, grand-daughter of William Lawson, pioneer explorer and one of the discoverers of the Blue Mountains. He was educated first at Geelong Grammar School, coming to England in 1886, and completed his education at Bath College and University College, Oxford, where he took an honours degree in Greats. He was called to the Bar in 1897, and joined the Oxford Circuit, practising until the increasing demands made on his time by THE MINING JOURNAL, in which his family already had an interest, obliged him to discontinue legal work. His legal background gave him a particular interest in mining law, and he has written extensively on safety and health conditions affecting mines throughout the world. He developed THE MINING JOURNAL service of special correspondents in the principal mining fields of the world, and in recent years has travelled widely to study changes in the mining fields consequent on the late war, with particular reference to the post-war prospects for British engineering products. He is a recognized authority on the metals—especially tin—having for 25 years contributed the chapter on that metal to the MINERAL INDUSTRY until it ceased publication in 1940. The gap left by its passing has perhaps in some measure been filled by THE MINING JOURNAL Annual Review. In 1902, Mr. Bahiol Scott married Gladys, daughter of Paymaster in Chief, W. C. P. Grant, R.N., and has two sons of whom the younger has since the war, been actively associated with the management of THE MINING JOURNAL.

ties of the Mineral Industry has changed even more than the craft they served. Even to record their names would be a task far beyond the permissible limits of this brief note. If an "old timer" may be allowed to impart a note of regret into what is otherwise a happy occasion, it is that their names and achievements are to-day so quickly passing into the oblivion which is the fate of old mine plans and records, which are of interest to the present and coming generation only for the light they shed on the possibilities of abandoned and perhaps forgotten deposits, mines and processes, at which we are now forced to look again as economic conditions change and the untraversed and unsurveyed tracts of the Earth constantly shrink.

The world is clearly passing through a revolutionary period in all social relations and it is impossible as yet to say whether a new concept of the proper boundaries of control and freedom can be established which will correspond with the proper spheres of both.

Technically the changes in 50 years have been enormous and will surely be progressively bettered, and the chief

practical issue in the coming years may lie in the question of the supply of risk capital without which the mining industry can not go forward.

From the point of view of occumenical economy the most conspicuous development in the past 50 years has been the growth of metal and mineral supply. Mining and metallurgy are among the world's oldest industries. Yet the output of minerals and metals in the past 50 years must have surpassed that of the whole 5,000 years since the Babylonian records indicated that they drew their copper supplies from Cyprus. In 1950 the world's copper output was approximately 5 times as great as in 1900; steel nearly 4½ times; zinc 4 times as great; gold practically doubled; coal and tin twice as great; lead 1½ times larger; and silver possibly somewhat lower; petroleum, that present bane of statesmen, has been multiplied some 27 times. Then we have the "new" metals; aluminium has risen something like 185 times and nickel some 12½ times. There has been an enormously increased demand for the alloy metals: tungsten, molybdenum, chrome, cobalt, manganese and among the earthy minerals for asbestos and vermiculite together with the emergence of a whole sphere of new industrial raw materials in the field of alloys. All these vast increases are imposing an enormous strain on the earth's mineral reserves leading to increase in prices which seem to

threaten the likelihood of similar gains in the future. The disproportionate rates of expansion have naturally been reflected in the shifting of public interest and capital investment. Gold was the predominant interest of the world's international financial centre—London—at the beginning of the century, but to-day Britain is being by-passed in favour of foreign or Commonwealth countries largely as the result of our existing fiscal policy and of the U.S. policy of restraint on gold prices.

More and more, too, we are conscious of the growing control exercised by the State on all mining enterprises. North America apart, most governments are becoming the major beneficiaries, through nationalisation and ever-mounting taxation, of successful mining undertakings; for those that can not pay their way they have little or no use.

It is impossible in a brief reminiscence such as this to make more than passing reference to the striking change which has overtaken the structure of the world's metal markets as free trading in the metals has become progressively more circumscribed through two world wars and the ensuing economic disruptions. Nor is it possible adequately to convey any impression of the tremendous technical advances which the mining and metallurgical industry has shown since the turn of the century. Most notable in this connection has been the tremendous increase in mechanization, both underground and on the surface, while in the treatment of ores the development of the cyanide process, of flotation, and of heavy media separation are perhaps the outstanding features of the period. In the sphere of development, pride of place must probably be given to the aeroplane, both as a tool without which modern systematic geological exploration would have been impossible on the scale with which we are familiar to-day, and as a vital factor in the rapid establishment of mining camps in inaccessible districts.

For these 50 years, as throughout its life, the *Journal* has maintained continuity of weekly publication save when restrained by Government action in 1947 and the Editor has lively memories of the improvisations by which skeleton issues were successfully produced in the General Strike of 1926 and again in the London composers' dispute last year. Fifty years has seen the demise or absorption of many newspapers and periodicals famous in their time like the *Mining and Scientific Press* of San Francisco, the *Mining World* of Chicago; and in London the *Financier and Bullionist* and the *Financial News* to name a few of the best known to say nothing of the trade and technical press of Germany and Austria under the stress of war. Others have arisen and will no doubt continue to be born, more especially journals of a specialized field.

In 1909 the format of *The Mining Journal* was changed from ordinary newspaper size to its present dimension and in common with the press generally its appearance has been improved to an extent which can be appreciated only when to-day's issues are compared with those early in the century.

Such then are a few of the reflections which pass rapidly before the mind of the Editor of *The Mining Journal* in this his year of Jubilee. If under his charge the paper has maintained its reputation and authority it is due largely to the foundations laid by its creator Henry English and the traditions which he established and to the good will of so many generations of readers. If in their judgment he has succeeded in maintaining them he is more than rewarded for his 50 years of service.

And so we pass into a new half-century, confident that though as so often in the past we seem to be approaching a crisis when a mineral famine seems almost in sight, human ingenuity and enterprise will successfully meet the challenge by new discoveries, more economic practice and the production of new materials. *Prosit res metallica*.

Gallium—A By-product Metal

Gallium, though only recently publicized, is not a newly discovered element, state Messrs. A. P. Thompson and H. R. Harner in the February, 1951, issue of the *Journal of Metals*. In 1861, Mendeléeff presented his famous paper "The Relation of the Properties to the Atomic Weights of the Elements." Subsequently, he predicted properties of a number of undiscovered elements. Three he designated a kasilicon, ekaboron and ekaaluminum. These later became known as germanium, scandium, and gallium, respectively.

Gallium was the first of the three eka elements to be identified and isolated in 1875 by the French chemist Lecoq de Boisbaudran. This was the culmination of a brilliant 15 year study of spectra.

GALLIUM CONTAINED IN GERMANITE

As might be expected from its proximity to aluminium, gallium is widely distributed in the earth's crust. It exists in roughly the same quantity as lead—about 15 grammes per ton of earth. Lead, however, is concentrated at favourable spots, while gallium is almost universally disseminated, but nowhere in significant commercial concentration. Insofar as the authors are aware, there is no mineral that contains gallium as a major constituent—the nearest exception being germanite, a complex zinc-copper-arsenic-germanium sulphide, found in the copper ores of Mansfeld, Germany, and in the Tsumeb copper-lead mine, South-West Africa. This mineral usually contains from 0.1 to 0.8 per cent gallium with one specimen reported to have contained as high as 1.85 per cent.

Gallium is frequently associated with germanium in the

comparatively rare mineral germanite, and in coals. Further, almost any sample of earth or clay, of which, of course, aluminium is a major constituent, will show a gallium content on the spectrograph often in the order of 50 grammes per ton or considerably over the average for the earth's crust. It is also found in bauxite and accumulates in the circulating liquors of the Bayer process from which it may be recovered.

MCCUTCHEON'S OBSERVATION

Gallium is closely tied to the Tri-State lead and zinc field of South-West Missouri, South-East Kansas, and North-East Oklahoma. The story of gallium in the Tri-State district began in 1915 with the early work of F. G. McCutcheon; when the leady heels or residuum left in the retorts was cast in slabs and stacked outdoors pending shipment to a lead smelter. Following a rain, he noticed beads or droplets of metal exuding from the slabs. On analyses these beads proved to be an alloy of about 94 per cent gallium and 6 per cent indium. The only explanation for the formation of the beads of metal was that the heels were a complex mixture of metals, including sodium and calcium. The latter are believed to have reacted with the rain water to release the beads of rare metal alloy. McCutcheon subjected several slabs to steam and reproduced the phenomena, collecting 300 grammes of alloy from one 700 lb. lot of heels so treated.

He developed recovery processes and produced the world's first pound of gallium metal, and, by 1944, had recovered some 6,000 grammes of the metal.

The Eagle-Picher Research group at Joplin had meanwhile become interested in gallium recovery. The Eagle-Picher lithophone plant at Argo, Ill., was processing 10 tons per day of roasted zinc ore and producing about 1,000 lb. per day of iron mud leach residue. McCutcheon pooled his knowledge with that of the research department and a process was developed for handling this material. It consisted of a caustic leach that dissolved aluminium and gallium compounds and some silica; precipitation as hydroxides; filtration and dehydration of the cake; hydrochloric acid leach; precipitation as hydroxides; solution of cake in hydrochloric acid; ether partition; electrolysis in caustic electrolyte; and fractional recrystallization of the recovered metal.

Since only 0.07 per cent gallium is concentrated in the iron mud leach residue, associated with about 10 per cent aluminium and 15 per cent iron as well as variable amounts of a great many other elements, the difficulty and cost of the separation can easily be realized. Gallium is \$2.50 to \$7.50 per gramme depending on the quantity purchased. A new recovery method must be developed for each new gallium raw material. Furthermore, use of strong hydrochloric acid is almost an essential step of any recovery process, introducing a severe construction materials problem, especially on a pilot plant scale.

CHEMISTRY OF GALLIUM

The chemistry of gallium is comparable to that of aluminium and also bears a marked resemblance to that of the two succeeding elements, indium and thallium. The stability of the compounds of these four elements decreases with increasing atomic weight. As a corollary, the ease of reduction to the metal increases with the atomic weight. All are permanent in air at ordinary temperatures, but when heated, develop a protective oxide coating. The normal hydroxides are amphoteric in the case of the first three elements and basic only in the case of thallium. Like aluminium, gallium forms alums.

The usual valence is three. With increasing atomic weight, the tendency to form compounds of lower valence becomes more marked, this property being most noticeable in the case of thallium. Aluminium normally shows no valence other than three, while gallium forms a number of divalent and even some monovalent compounds.

Gallium metal is most unusual in its properties. It has one of the longest liquid ranges of any element, melting at 29.75°C. (85.5°F.), (about 70°C. higher than mercury), and boiling at 1983°C. (3601°F.). There is some difference of opinion on the boiling point, values up to 2100°C. and higher being reported. The boiling points of its congeners, aluminium and indium, are of the same order while that of thallium is about 500°C. lower. The vapour pressure of gallium remains quite low at comparatively high temperatures, being only 1 millimetre at 1315°C. (2399°F.).

Gallium is one of the few metallic elements that expands on solidifying. The liquid density at 29.8°C. is 6.095 grammes per cubic centimetre while the solid density at 20°C. is 5.907 grammes per cubic centimetre, roughly a 3 per cent expansion on solidification—almost as great as that of bismuth, 3.3 per cent. One supplier packs the liquid metal in rubber bulbs. Eagle-Picher supplies the metal as clean crystals dipped from the melt while cooling, packed in sealed Pliofilm bags. Should the metal accidentally become warm and melt, it cannot escape. On resolidifying, the elastic Pliofilm prevents rupture and loss.

Gallium crystallizes in the orthorhombic system, and beautiful specimens are produced. The exact shape of the crystals varies from thin square plates to thick and massive spear points.

As might be expected from its position in the periodic table, gallium is a chemically active metal. The literature

contains an imposing list of alloys and solid solutions with other metals. Since certain suggested uses for gallium are based upon its long liquid range and low vapour pressure at elevated temperatures, the matter of reactivity and of a suitable container is important.

MANIFOLD USES

A wide variety of uses has been suggested for gallium, ranging from low melting-point alloys to the treatment of bone cancer. The first use proposed was a fill material in high temperature thermometers. Practical difficulties arose such as the lack of availability of quartz glass tubing. It is understood that some thermometers have been produced but the cost has been exceedingly high and the results far from satisfactory.

The use of gallium as a backing material for optical mirrors has been suggested as it reflects a high percentage of the incident light. For certain purposes in atomic and astrophysical spectrum research work, the gallium lamp has proved quite useful. The Bureau of Standards reported satisfactory service from quartz vacuum lamps using Ga-Zn and Ga-Cd mixtures to replace mercury.

The Atomic Energy Commission has investigated gallium as a possible heat-exchange medium. Its favourable thermal characteristics, particularly the long liquid range and low vapour pressure, encourage consideration of its use in extracting heat from a high level, since any atomic energy power plant must use temperatures considerably above those of conventional steam-power plants if even a small part of the potential energy is to be utilized. However, thus far, gallium's considerable reactivity as expressed in terms of attack on possible container materials has delayed its application in this field.

The addition of a small percentage of gallium oxide to relatively high grade uranium-base material in the form of the oxide, and subsequent fractional distillation in the dc arc, has made it possible to determine 33 volatile impurity elements at concentrations as low as a fraction of a part per million.

One principal use of gallium reported by the Germans is in organic synthesis. Its chloride salts act as catalysts in the Friedel-Crafts reaction. In some cases a smaller amount of catalyst is required than when other chloride salts are used; in other cases a higher yield is obtained or the reaction time is shortened.

GALLIUM ALLOYS

Low-melting point alloys are formed by gallium with indium, tin, and aluminium, and may find use in fire alarm systems. The addition of 2 to 4 per cent gallium improves the mechanical properties of aluminium. Gallium increases the hardness of aluminium ternary alloys. An iron alloy containing 3 per cent gallium and 14 per cent nickel resembles beryllium and titanium steels in hardenability. The addition of 4.5 per cent gallium will harden magnesium on heat treating. Gallium also may find a place in electrical contact alloys.

Prior to 1932, gallium was available only in small quantities for laboratory research purposes. In 1932, the Chemical Manufacturers' Association of Leopoldshall (Germany) began to recover gallium from the residue from the Mansfeld copper schists. By 1937, the annual production had risen to about 50 kilogrammes. Directly prior to World War II, German production was about 300 lb. per year.

During the period 1943 to 1945, the Anaconda Copper Mining Co., in connection with its recovery of indium, produced several thousands grammes of gallium. In 1946, The Eagle-Picher Co. was the only producer, but Aluminium Co. of America entered the field in 1947, and, in 1948 the Saratoga Laboratories, Inc., started production. Since 1946, a licence has been required for the export of the metal.

Western United States

(From Our Own Correspondent)

San Francisco, May 20.

In an effort to stimulate production of fissionable minerals the Atomic Energy Commission has announced an increase in the price that it will pay for U_3O_8 in ore. Ore as low as 0.10 per cent (2 lb. per ton) will be purchased and the price will be \$1.50 per lb. instead of 50c. as formerly, with a price scale graduating to \$3.50 per lb. in ore of 0.20 per cent grade or better. Various other benefits are included in the new schedule.

Kennecott's annual report gives some idea of the scale on which this corporation operates. It controls Utah, Nevada Con., and Chino and Ray Con. in this country and Braden in Chile. During 1950, these various companies mined 55,000,000 tons of ore from which were produced 1,152,000,000 lb. copper, 29,400,000 lb. of molybdenite, 5,400,000 lb. of zinc, 3,600,000 oz. of silver and 450,000 oz. of gold. It was only in comparatively recent years that it was ascertained that the "porphyry" copper ores contain very small, but recoverable amounts of molybdenite, which has become an important by-product of the operations.

In line with the policy to assure adequate supplies of critical minerals for defence, manganese and molybdenum have been placed under "allocation." This practically bans delivery of these minerals not authorized by the Defence Minerals Administration and calls for monthly reports of inventories and anticipated supplies from those using them.

Arizona.—More detail is available regarding development by Phelps-Dodge of its Bisbee east ore body, which is to be known as the Lavender pit. Estimates based on preliminary exploration indicate that the ore body contains 41,000,000 tons of concentrating ore averaging 1.14 per cent copper and 31,000,000 tons of leaching ore averaging 0.42 per cent, a total of 72,000,000 tons of an average of 0.83 per cent, which would indicate an ultimate production of approximately one billion lb. of copper. It is estimated that \$25,000,000 will be required to put the property on production which will not be before 1954 or 1955.

San Manuel states that it will continue development for at least another year before construction of reduction facilities is undertaken. Ultimate investment will be between \$50,000,000 and \$75,000,000 and will open for production what is probably the largest copper deposit in the U.S. Tonnage is estimated at 460,000,000 of an average grade of 0.78 per cent, which should result in an ultimate production in excess of 6 billion lb. of copper.

California.—Wah Chang Corporation, one of the world's largest buyers and processors of tungsten ores, has organized the Black Rock Mining Corporation with headquarters at Bishop, Inyo County. Four mines have been acquired under lease and the company has bought the Northumberland mill, which it is moving to the Bishop area from its site near Tonopah, Nevada. Mill capacity will be increased to 750 tons daily.

U.S. Carbide and Carbon Corporation has installed a new custom mill for treatment of tungsten ores at Pine Creek, also in the Bishop district, where its principal mining operations are located.

Idaho-Maryland, the largest gold mine in the State, has found tungsten ore in the course of some new development and is conducting tests to determine the best method of handling.

Colorado.—Climax Uranium Co., recently organized affiliate of Climax Molybdenum Co., has developed its Calamity mine in Mesa County to the point that regular shipments of ore are being made to the 150 ton mill at Grand Junction. Climax also operates at Mexican Hat, in the same district, but over the State line in Utah.

The Molybdenum Corporation of America is reconditioning its mill at the Urad mine in Clear Creek County. Urad was developed as a silver mine, lay idle for years and it was not until World War II that it was discovered that the little black specks in the ore, which had been ignored for years, constituted its principal value.

The 1,000 tons mill of Golden Cycle Corporation was put into regular operation in the middle of March. It is the largest custom gold mill in the country and will serve the principal mines of the Cripple Creek district with a short haul over moderate grades instead of the 75 miles of mountain road necessary when the mill was located at Colorado Springs. The new mill, with the Carlton tunnel, which affords deep drainage to the mines, will give this famous 60 year old district a new lease of life.

Homestake Mining Co., the largest gold producer in the country, has become associated with Newmont Mining Co. in the latter's operations in the San Juan district by acquiring a 10 per cent interest in the Idarado Mining Co. and a 20 per cent interest in the Atlas Mining Co., both Newmont controlled.

Idaho.—Recent developments in the Coeur d'Alene area indicate that this 65 year old district is far from reaching the end of the trail. Most interesting of recent explorations has been on the deeper workings of the Vulcan Silver-Lead Co. Federal Mining Co. entered into an agreement with Vulcan to deepen the latter's Galena shaft from the 800 to the 3,000 level and this work has been completed. Exploration from the 2,930 level has opened new ore bodies and found the extension of the Vulcan vein which has been the main producer in the upper horizons of the mine. Federal is a subsidiary of American Smelting and Refining Co. and Vulcan of Callahan Lead-Zinc Co.

Nevada.—Newmont Mining Corporation has announced that it will suspend operations at Goldfield because systematic exploration and development over the past several years have failed to reveal ore bodies of sufficient value or extent to justify the expense of putting the property on production. In view of the sensational values found near the surface in the bonanza days of the camp it was expected that intelligent exploration of the lower levels would prove the existence of ore bodies that would be profitable with the new techniques in mining and metallurgy. About 15 years ago Eastern Exploration Co., subsidiary of Calumet and Hecla Copper Co., made a similar experiment with the same result and it would seem that the failure of two such companies with ample capital and technical skill writes *finis* to this famous camp.

International Smelting and Refining Co. (Anaconda) has applied to the Reconstruction Finance Corporation for a \$10,000,000 loan for development of a large copper deposit west of Yerington in Lyon County, where drilling indicates an extensive deposit of better than average grade. A new town and a smelter are included in the plans. The district has produced copper in a more or less irregular manner for the past half century, but no attempt has been made so far to consolidate the various properties and operate on a large scale. Past production of the district is estimated at 86,000,000 lb.

Washington.—Anaconda Copper Mining Co. has made a payment of \$500,000 on its \$2,000,000 option on the Bonanza lead mine and mill near Colville and has taken over operation of the property. Bonanza is an old property with a considerable aggregate production, but its full possibilities have never been realized. Anaconda also has an option on the Gold King near Wenatchee and is sinking an exploration shaft there.

Pacific Northwest Alloys, Inc., which has been producing ferrosilicon at the war-time magnesium plant at Mead, is now converting a part of that plant for magnesium production.

Iron and Manganese in Brazil

An indication of the large reserves of high-grade iron and manganese ores in Brazil can be gleaned from an appraisal of the deposits discovered, and the tonnages estimated in certain areas surveyed co-operatively since 1940 by scientists of the Geological Survey, U.S. Department of the Interior, and Brazilian geologists, U.S. Secretary of the Interior, Oscar L. Chapman, stated recently.

While an accurate appraisal of the tonnage that could be developed is not yet possible because detailed geological surveys are incomplete, investigations, now being expanded under the Point Four programme, have verified the existence of the two largest deposits of high-grade manganese known in the Western Hemisphere. These include an estimated 33,000,000 tons of ore in the Morro do Urucum area of Mato Grosso Province, near Corumba and the Bolivian border, and an estimated 7,000,000 tons in the Serra do Navio District, Territory of Amapá, just above the Equator and north of the Amazon River.

RICH DEPOSITS FOUND

Rich deposits of high-grade iron ore have also been found in the Morro do Urucum area. Of the manganese reserves reported there—aggregating about 4,420,000 tonnes of measured ore, 11,750,000 tonnes of indicated ore, and 17,500,000 tonnes of inferred ore—the average content is reported to be 45.6 per cent manganese and 11.1 per cent iron. In addition, 1,310,000,000 tonnes of banded haematitic iron formations reported are expected to average about 55 per cent iron and 20 per cent silica.

It was also found that detrital iron ore has accumulated on the slopes of the mountain in the Morro do Urucum area. In the one area prospected there is about 450,000 tonnes per metre of depth of indicated ore and between 500,000 and 800,000 tons per metre of depth of inferred ore. After screening, this ore is expected to average about 64 per cent iron and 4 per cent silica.

In the Serra do Navio District of Amapá, 28 separate deposits of manganese oxide outcrops have been uncovered in the tropical rain forest on the banks of the Amapari River in an area seven kilometres long and one kilometre wide. Many of these outcrops rise in sheer cliffs of high-grade ore to heights of 20 metres or more, ranging in length from a few metres to more than 250. This ore averages about 50 per cent manganese on outcrops. Tonnage is estimated as: visible 585,000 tonnes, probable 2,700,000 tonnes, and possible 4,000,000 tonnes.

Under the expanded co-operative minerals investigation programme, authorized by the International Development Act for Point Four assistance, Geological Survey scientists are helping Brazilian technical men determine how much iron ore is contained in a mountain range in the State of Minas Geraes. This area, roughly 4,000 sq. miles, is north-west of Rio de Janeiro and one of the largest sources of high-grade iron ore in the world.

The current investigation programme planned in various areas until 1958, will provide Brazil with facts about uncharted resources and information on which to base future mining operations. Continued co-operation between Brazil and the U.S. will be particularly advantageous to both countries because of the need of Brazil to build up dollar assets and because of critical needs for both iron and manganese in the United States.

In some of the areas where deposits have been charted, several American industrial groups have started mining operations, jointly financed with Brazilians, to obtain iron, manganese, nickel, and other materials. These American firms supply the technical and management specialists, but own only a minority interest in the ventures.

The present work of U.S. Geological Survey scientists in the Minas Geraes area is under direct supervision of W. D. Johnston, Jr., chief of the Survey's Foreign Geology branch, who spent several years in Brazil co-operating with the Brazilian Departamento Nacional da Producao Mineral. At work there now, with headquarters at Belo Horizonte, are John Van N. Dorr, II, Joel B. Pomerone and Philip W. Guild, all Geological Survey geologists.

As regards the most promising work in the Minas Geraes area, Mr. Dorr states that long ridges of itabirite (metamorphosed iron formation), in the south central part of the area, are punctuated here and there with large deposits of ore of highest quality. Actually, he points out, past estimates may be quite erroneous because the hard iron ore is resistant to tropical weathering and crops out boldly, causing early prospectors to overestimate the percentage of hard ore and underestimate the amount of softer ores, seldom seen as outcrops.

Recent exports from this area have been largely confined to the hard, high-grade lump ore, mostly obtained from Cauê Peak in the Itabira district, operated by Companhia Vale do Rio Doce (exporting via Vitoria), and Casa da Pedra mine of the National Steel Co., near Congonhas do Campo, which sends its production to the steel plant at Volta Redonda. Other smaller mines near Brumadinho and Belo Horizonte are worked largely by hand methods and export ore through Rio de Janeiro.

Mr. Dorr, who was also responsible for the report of high-grade manganese and iron ores in the Morro do Urucum area of Mato Grosso Province, said that the deposits of both manganese and iron in that area occur in the Jacadigo series, of unknown, but probably late pre-Cambrian or early Paleozoic age. Geologists have further sub-divided this into Urucum, the Corrego da Pedra, and the Band' Alta formations. They found a widespread bed of manganese oxide (cryptomelane) at the base of the Band' Alta.

TRANSPORT DIFFICULTIES

Transport of this ore from Serra do Navio to the Amazon, a distance of about 240 kilometres, will be difficult unless a railway is built. The Amapari River, on the banks of which the manganese oxide outcrops have been found, is navigable for barges only eight months of the year and trucking of heavy tonnage is not practical on the existing road. Port facilities on the Amazon will also have to be constructed, but an excellent site is available.

Manganese was first found in the Serra do Navio district in 1941 by Señor Mario Cruz, a woodsman, searching for gold. He was unfamiliar with the material and used a large piece for ballast in his canoe, dumping it on the bank when he reached Porto Grande. When the Hanna Co. began prospecting for iron in the Santa Maria area in 1946, Señor Cruz thought the material he found might be iron and took some of it to the Governor of the territory. When it proved to contain 55 per cent manganese, Señor Cruz guided the Governor's representative to the deposit, now known as Chumbo. Since then a number of geologists have visited the area, among them representatives of Industria e Comercio de Minerios, Ltda., the M. A. Hanna Co., the U.S. Steel Co., and the Union Carbon and Carbide Co. Field work in the Serra do Navio district by the Geological Survey was accomplished by Mr. Dorr, Charles F. Park, Jr., and Glycon de Paiva. Their report, "Manganese Deposits of the Serra do Navio District, Territory of Amapá, Brazil," forms Geological Survey Bulletin, 964-A.

I.C.I. Activities—1950

Throughout 1950 the demand for the products of the General Chemical Division was at a high level, and increased throughout the year. Record outputs were obtained for many products although there were periods when demand could not be wholly satisfied. However, with the exception of sulphuric acid, the shortages were not serious. This shortage, the Annual Report stated, was not altogether unforeseen, and plans had already been made to convert a large part of the Division's sulphuric acid plant, based on sulphur to the use of other raw materials. Although this conversion, when eventually completed will not counterbalance all the sulphur shortage, it will assist materially towards that end. (It will be recalled that last month a company named The United Sulphuric Acid Corporation Ltd., was registered as a private company for the purpose of erecting and operating in this country a plant for the production of sulphuric acid from anhydrite, a project which Imperial Chemical Industries, in company with four other concerns, is playing a leading part. The plant will be designed to produce some 150,000 tons of sulphuric acid per annum and it is estimated that the minimum cost of the capital equipment and working capital is £3,500,000.) The total exports of the Division, in terms of sterling, were about 45 per cent greater than in 1949, and exports to dollar markets were three times as high, in sterling, as in the year 1949.

In the Metals Division, demand increased as the months passed, and by the autumn production had risen in some sections to the highest peace-time level reported by the Division. The war in Korea exercised a marked influence on the world prices of all non-ferrous metals, and shortages developed in the second half of the year in the supply of zinc, aluminium and nickel. In spite of import controls in several of the Division's markets, together with the effect of increased local manufacture, both of which tended to restrict export sales, sales to the dollar markets showed a substantial increase over 1949.

Production in the Nobel Division during 1950 also achieved the high level of activity of the previous year, both for explosives and accessories, and also for the Division's non-explosive products. The increased requirements of the South African mining industry was reflected in the demand for safety fuse, the production of which was achieved mainly by a higher operating efficiency with the existing plant. In the export field the Division achieved record sales in practically all its products. The principal feature of the year was the securing of additional business formerly held by American competitors, particularly in South America and the Middle East, and of orders for explosives accessories in the United States.

At Whitby, Yorks, the deep drilling investigations made good progress and during the year two more exploratory boreholes were started. By the end of the year full results had been obtained from three boreholes and the company announced in October last that valuable deposits of sylvinites had been proved in the area.

The research work carried out during the year resulted in a new type of explosive for seismic prospecting reaching the production stage. This new explosive is specifically designed to facilitate oil prospecting carried out at great depth. In the company's Report for 1949 it may be recalled that mention was made of the newly developed safety coal mining explosive, "Unibel." During 1950 two further explosives of this class have been added to the range. Of these, "Unikol" is a low density explosive, designed to be equivalent to sheathed. Al "Rounkol," and the other, "Unigex," is to replace sheathed permitted gelatines.

REVIEWS

Resistivity Prospecting

An illustrated Pocket Book on Resistivity Prospecting with Megger Earth Testers has recently been issued by Evershed & Vignoles Ltd., Acton Lane Works, Chiswick, London, W.4 (Publication No. 245). It contains nine chapters, giving details of the resistivity method of prospecting which has been found extremely useful, in a great number of cases, for the elucidation of geological conditions and structures involving rocks of differing resistivity in juxtaposition.

The titles of the first three chapters are: Some Conditions Affecting Resistivity; Methods of Measuring Resistivity, and Problems Suitable for Resistivity Observations. Testing Instruments form the subject of Chapter 4, which contains particulars of the Ordinary Megger Earth Tester, the Low Resistance Megger Earth Tester, and the Geophysical Megger Earth Tester. This is followed by Chapter 5 on Auxiliary Equipment necessary for field work, e.g., electrodes, cable drums, tapes, pegs and stakes. Chapters 6 and 7, respectively, are devoted to Field Procedure, and to Planning a Survey, and the last chapter deals with Some Special Methods of Resistivity Measurement. A comprehensive Bibliography enhances the value of this Pocket Book, a limited number of copies of which is available to *bona fide* applicants free of charge.

Wakefield Technical Publications

"Bearing Lubrication" is the title of one of the latest additions to the series of attractive technical publications issued by C. C. Wakefield & Co., Ltd., 46, Grosvenor Street, London, W.1, the well-known lubrication specialists.

This book, which may be obtained from Department P.D. (Price 21s.), covers a wider field than is indicated by its title; the reason is that proper lubrication is only the final link in the chain of conditions necessary for successful bearing operation. The emphasis is on the practical side and while the company does not pretend that this book is more than a guide to good bearing operation, it makes available to readers the company's half-century of experience.

Of special interest to readers of *The Mining Journal* is another illustrated publication issued in this series, entitled "Rock Drill Lubrication" which provides operators of drilling equipment with a comprehensive survey of the various types of drills and kindred tools in current use, their operation and proper lubrication.

A limited number of copies of "Rock Drill Lubrication" is available, free of charge, to *bona fide* applicants.

Foreign Investment Laws and Regulations of the Countries of Asia and the Far East.—Prepared by the Secretariat of the United Nations Economic Commission for Asia and the Far East. Pp. viii + 88. Obtainable from H.M.S.O. Price 5s.

This report on foreign investment laws and regulations of the countries of Asia and the Far East, undertaken in pursuance of the Economic Commission for Asia and the Far East, is one in a series of studies related to problems of economic development undertaken by the Secretariat at the request of the various U.N. organs. The countries covered are Burma, Ceylon, India, Indo-China, Indonesia, Korea, Malaya and Singapore, Nepal, North Borneo, Pakistan, the Philippines, Thailand and Japan. Details are given of Government policy; nationalization of industries; economic and other controls (including particulars relating to the exploitation or development of mineral resources, remittance of dividends, immigration) and taxation. Exchange rates and authorities to be contacted by prospective foreign investors in the various countries of the region are given in appendices.

Machinery & Equipment

Taurus Bronze Castings

We have just received a copy of one of the latest lavishly illustrated technical publications issued by David Brown & Sons (Huddersfield) Ltd., Park Gear Works, Huddersfield, dealing with the composition, manufacture, and application of Taurus bronze castings.

Particularly noteworthy are the illustrations, on pp. 14 to 19 inclusive, showing the structure of various types of bronze and bronze alloys, and believed to be the first illustrations of this type to be reproduced in this form in a British publication.

This book undoubtedly provides a valuable practical treatise devoted to the composition, properties, manufacture and application of bronze castings for engineering purposes, with an illustrated commentary on the control, manufacture, testing and application of Taurus bronze castings.

Copies can at present be offered only to important users of bronze castings.

U.S. Equipment for Underground Cleaning of Mining Machinery

It is claimed that with the new M.S.A. All-Electric Steam Cleaner (approved by the U.S. Bureau of Mines) made by the Mine Safety Appliances Co., Pittsburgh, Pa., coal mining machinery can now be completely, quickly and safely degreased and cleaned at any point in a mine where electricity and water are available.

Machines to be cleaned no longer need be moved from the operating location, or taken to the surface, an operation which often requires dismantling and involves loss of time. Cleaning can be done with labour available at the mine; this is stated to be particularly important in case of overhauls, especially as much as 40 per cent of a mechanic's time may be spent cleaning a machine before repairs can be started. The use of combustible and toxic cleaning agents is eliminated and M.S.A. Cleaning Compound, a non-inflammable powdered cleaner, has been developed for use. Grease and dirt are cut, dissolved and driven from machinery with a blast of the steam which has passed through an electrically heated manifold in the cleaning mechanism.

Besides keeping mining machinery operating efficiently, regular cleaning also eliminates fire hazards caused by accumulations of grease, oil and coal dust on equipment.

A 20-gallon tank on the machine holds enough of the above cleaner in solution for four hours of steady operation. Water is supplied by a hose at the rate of 60 gallons per hour at pressures from gravity to 150 lb./sq. in. Solution and water are automatically mixed in the proper proportion and passed through a series of five electric heaters before being supplied as steam to the delivery system. Three types of nozzles are supplied, two for cleaning flat surfaces and the other for irregular surfaces. Automatic controls and safety devices permit operation of the machine without further attention after the flow of cleaner has started.

In addition to the type approved by the U.S. Bureau of Mines for use in any location, a standard model is available for use in fresh air and underground or outside repair shops.

The cleaners, patented and built under Homestead-Yeager design, are constructed of reinforced and welded steel and are completely portable. They weigh about 800 lb. Their overall height of 32 in. permits their use in low coal mines. Operating pressure is from 100 to 120 lb./sq. in.

The Victor Water Feed Attachment

The Victor Water Feed Attachment, made by Victor Products (Wallsend), Ltd., Wallsend-on-Tyne, can be screwed on to any Victor drill in place of the machine chuck. When wet drilling is demanded to avoid the dangers of pneumoconiosis and other kindred diseases, Victor rotary drills with the water feed attached are claimed to have given extremely satisfactory results. For this drilling condition the company recommends that the water pressure should be 20/60 lb./sq. in. and the approximate water consumption 10 galls. per hour. For the removal of curvings when drilling long horizontal holes or drilling vertically downwards, water pressure should be 40 lb./sq. in. and the approximate water consumption should be 30 gall. per hour. The maximum water pressure in any application of Victor Rotary Drills fitted with the water feed attachment should be 60 lb./sq. in.

The Canadian International Trade Fair

It is expected that the 1951 Canadian International Trade Fair, to be held in Toronto from May 28 to June 8, will even surpass the successful 1950 Fair. Due to the success of previous Fairs on one hand and because of certain economic factors, including material shortages and expanding production all over the world on the other, the Fair this year will be substantially bigger than last year, and a wider variety of products will be shown.

Great Britain will again likely be the major exhibitor. Space required to show British exhibits will be about the same as last year when close to 70,000 sq. ft. was booked. The trend towards associated exhibits, involving the goods of many firms producing similar products exhibited in contiguous booths and under the aegis of an exhibiting committee is again evident.

The section of the Fair devoted to machinery, plant equipment and related capital goods will, as usual, be the largest and most impressive of the show. The present trend indicates that it will almost certainly be larger than last year, when nearly 65,000 sq. ft. of space was used to show exhibits from 11 countries with the U.K. as major exhibitor. It appears that the accelerated effort of British capital equipment manufacturers to broaden their world markets through this Fair is to a major degree the result of the outstanding success the majority of exhibitors experienced at the 1950 Fair. "It may be taken as a fact that the prestige of the British manufacturer who took part in the show has been raised to a height never before achieved in Canada, and that the exhibitors left behind them an atmosphere of respect for their products and a greatly enhanced desire to possess them," a spokesman commented.

Among British exhibits will be several types of fork lift trucks as well as many other lines of material handling equipment. Included in this section will be a working model of an aerial ropeway and mechanical handling installation. A British manufacturer of filters is exhibiting for the purpose of establishing an agency in Canada to supply a market he feels has untapped potentials. His product has two distinctive features for reconditioning used oils: every trace of impurity is said to be filtered out in a single passage, and the filtering medium itself can be cleaned simply by reversal with compressed air.

A compressed-air operated "Electropump" for pumping difficult liquids will be exhibited, and Diesel road rollers and earth moving equipment, static and dynamic balancing machines for all rotating bodies, die sinking, drilling machines of all types, radial, vertical and portable boring machines, compressors, lubricating equipment and extrusion machines, etc., are other U.K. exhibits.

Metals, Minerals and Alloys

The United States Mobilization Director, Mr. Charles E. Wilson, on Tuesday ordered defence agencies to ensure "adequate exports of scarce supplies" to nations allied against Communism.

Copper.—While the world export price for electrolytic copper is now 27½c. per lb. in New York, and the U.K. price has been advanced correspondingly to £234 per ton, the U.S. price for domestically mined copper remains at 24½c., at which it was stabilized by the Freeze Order of January 25. Customs smelters are therefore out of the market as sellers of copper produced from foreign concentrates, unless they can persuade the Office of Price Stabilization to come to their relief. This suggests that foreign concentrates will move still more largely to countries other than the U.S. It has been computed that U.S. imports of copper in all forms may be 500,000 tons below last year's supply. The heavy cuts in civilian consumer allocations announced last week may help to offset the shortage but Defence Orders will probably take up any of the slack in purely civilian uses. However, the U.S. Government is believed to hold a stock of some 600,000 tons of metal and can probably ease the domestic shortage from this source. The Secretary of the Interior, Mr. Chapman, recently admitted the difficulties entailed by the double objective of maintaining the price structure in the country and meeting the high cost of domestic production needed to fill the gap. Even if the view of the General Services Administration that Government has the authority to pay a subsidy to assure the availability of foreign concentrates be upheld, no funds apparently are available as yet for this purpose. Meanwhile production of copper in foreign countries should be stimulated by the big rise in prices. While increased subsidies will probably be made available for United States copper mines these cannot relieve the short-term situation.

U.K. imports in April were 37,277 tons (electro 26,277; blister 11,000), against March 37,738 tons. Northern Rhodesia supply amounted to 21,116 tons.

Lead.—There is little fresh to report in regard to lead. The U.S. "official" price is unchanged at 17c. with the U.K. price conforming at £160 per ton. Some of the background in regard to the lead policy where it coincides with the zinc position is reported below under that metal. The U.S. Government has not yet issued its long-announced specific ceiling price regulations on primary and secondary non-ferrous metals, and is probably waiting till it secures a greater degree of control under the C.M.P.

The Tunisian lead mines reached a new post-war record in April with a production of 2,847 tons.

Tin.—So far world demand appears to be taking care of the cessation of United States buying and prices have continued steady within comparatively small limits. On another page will be found a report of Mr. E. M. F. Fergusson's speech to the shareholders of the Straits Trading Co. held at Singapore last week, and this balanced statement is discussed more fully in our Notes and Comments elsewhere. The R.F.C. maintains its price for Grade A tin at \$1.39 per ton, equivalent to £1,112 per ton on a flat basis. Allocations to United States industry in May have been reported as 3,540 tons implying a considerable draught on stocks. The Indonesian Government has stated that they will comply with the United Nations' embargo on the shipment of strategical materials to China and North Korea, and that thus far no exports of important materials have taken place. There is no further news concerning the situation in Bolivia.

While a U.S. Defence Order will increase the reservations of tinplate to 10 per cent in July, as compared with 5 per cent in June, manufacturers are more apprehensive as regards the supply of steel than of tin.

Zinc.—The trade is urging a further suspension of the import duties of zinc and lead. During the third quarter civilian consumption will be restricted to 70 per cent of the high grade and 80 per cent other grades consumed in the base period. The day is believed to be drawing nearer when all metals will be bought under the Controlled Materials Plan. The Government hopes that supply and demand in respect of both these metals can be brought into a substantial balance after 1953 through subsidies and other assistance, and they propose to pay a bonus of 4c. per lb. for new zinc and lead output over the next two or three years. Funds for the purpose are included in Budget proposals now before Congress. It is expected that producers will be asked shortly to set aside increased quantities of zinc for D.O. and to establish monthly emergency reserves from their anticipated production. The inventory controls on consumer stocks will also be tightened.

Aluminium.—The enormous growth in aluminium production since the beginning of the last war was the theme of an address by Mr. T. T. Coffin, of Alcoa, who said that the projected capacity in North America was now 1,808,000 tons, about seven-and-a-half times the pre-war figure. He believed that aluminium would continue to replace many products, especially copper and brass, to an increasing extent, and that many new uses would develop as the result of its low price, and with its inherent favourable physical and chemical attributes: in fact we might be entering the Aluminium Age.

The Golden Manitou Mines in Quebec has negotiated the sale of 175,000 tons to the American Zinc Lead & Smelting Co. based on the present U.S. domestic price of 17½c. for prime Western E. St. Louis. These concentrates are to come from the company's new property at Barvue situated in Barrute township, 25 miles north of its main property near Val d'Or, which is expected to come into large scale production about March of next year. The concentrates will be shipped first to Arvida where Alcan is to erect a \$3,000,000 plant where they will be roasted to produce some 35,000 tons of sulphuric acid a year, after which the calcines will be shipped to the United States. The concentrates are expected to average about 56½ per cent zinc and 31 per cent sulphur. The contract is for three years. While production after March may reach between 5,000 and 6,000 tons of concentrates a month, it may then take two and a half to three years to complete the whole of the order.

Mr. Rice, president of the Reynolds Mining Corporation in Jamaica, recently stated that the area held by the company in the island extending over some 40,000/50,000 acres, was by far the most important bauxite body ever discovered, containing sufficient mineral to supply the United States with aluminium for many decades.

A new fabricating plant is projected in Spain by Manufacturas Metallicas with the assistance of British, Canadian and Swiss technicians. The factory is planned to be the third largest in Europe, and may be built either at Vigo or somewhere on the Mediterranean coast. It will produce all kinds of aluminium fabrications, including canning containers.

Asbestos.—U.K. imports in April were 10,162 tons (10,112 tons in March). Southern Rhodesia supplied 4,140 tons and Canada 3,207 tons.

Manganese.—U.K. imports in April were nearly double the March figure at 27,102 tons. The improvement was chiefly due to shipments from India amounting to 14,921 tons but South Africa supplied 7,235 tons.

Molybdenum.—The U.S. Office for International Trade has announced a second quarter export quota of 1,250,000 lb. of ores and concentrates and one of 195,000 lb. for metal, from alloys scrap and wire.

Nickel.—U.K. imports of nickel in all forms totalled 309 tons in April compared with 478 tons in March. Imports of concentrates and matte totalled 3,423 tons (2,917 tons in March).

The price was raised by Inco to £454 a ton from to-day—56c. per lb. f.o.b. Port-Colborne.

Sillimanite.—The Secretary of Australian Industrial Minerals operating a producing property at Mount Crawford, not far from Adelaide, reports the receipt of many enquiries for sillimanite, more particularly from Sweden, Italy, Czechoslovakia and the Argentine. Great Britain and France have already taken substantial amounts. Despite the world shortage, supplies at Mount Crawford were, he declared, ample.

Tungsten.—The price is definitely hardening and has moved up appreciably during the week. This is generally believed to have been due to more attention being paid on the part of American buyers. While some material has been done this week at 530s. for prompt delivery, the forward price may be called 530-540s. c.i.f.

Gold.—The Transvaal output in April was 948,291 f.o.z. compared with 952,864 in March and 947,204 a year ago.

The W. Australian output in April was 47,150 f.o.z.

The Idaho-Maryland Mines Corporation, at Grass Valley, California, reports the discovery of an important new ore body in a hitherto unexplored area between the 2,300 ft. level and the bottom of the Brunswick mine, which should assure 15 or 20 years of productive operation. This mine, which, before the war, was second producer of the United States, produced 48,598 f.o.z. in 1948 with some silver.

The International Monetary Fund, which is due to meet in Washington early in September under the chairmanship of Mr. Abbott, Canadian Finance Minister, is understood to be making enquiries regarding the sales of gold at premium prices, which are said to have increased sharply. According to the *Northern Miner* more than half of the gold production of the Western World was diverted last year from monetary authorities. South Africa is understood to be requesting permission to make still larger sales, and Canada and W. Africa are anxious also to benefit by this relaxation of price control. There has been an increasing import of partly worked gold and silver—presumably largely fabricated gold—into this country recently according to the B.O.T. figures. The April import was 23,505 oz. and the total for the first four months 149,247 oz., compared with 84,151 oz. for the same period of 1950, and 25 oz. for the same period in 1949.

The Annual Report of Director of the U.S. Mint estimates the world gold output in 1949 as 30,600,000 f.o.z., including an allowance of 7,000,000 f.o.z. for the U.S.S.R. This is 5,000,000 f.o.z. more than the conventional figure adopted by the Union Corporation in its annual statistics.

The London Metal Market

(From Our Own Metal Exchange Correspondent)

The main conversation during the week has centred upon the extraordinary steadiness of the Singapore Tin price in face of complete cessation of American buying and apparent indifference of Continental consumers. No satisfactory answer has yet been found, and the publication of the details of shipments made against purchasers during first half of May will be studied with great interest. Everywhere consumers are tending to buy from hand to

mouth as the opinion is gaining ground that eventually the sterling price will have to come down into some nearer relationship with the R.F.C. selling price, which still remains unchanged.

The confusion in the American copper market has not been cleared up by the 3c. rise in the export quotation, as this has done nothing to enable the American purchasers of Chilean copper to make a corresponding increase in the price of their products, and it is understood that pressure is being exerted upon the Administration to take some action to set this right, but it appears to be a matter of very great difficulty and no action is expected for some weeks. In the free market the prices remain steady with a slightly rising tendency in the price of lead.

On Thursday the official close on the tin market was: Settlement price £1,125, Cash Buyers £1,122 10s., Sellers £1,125; Three months' Buyers £1,107 10s., Sellers £1,110. In the afternoon the market was steady. Turnover for the day was 45 tons. Approximate turnover for the week was 600 tons.

The Eastern price on Thursday morning was equivalent to £1,142 5s. per ton c.i.f. Europe.

Iron and Steel

North-East coast shipbuilders have become so seriously alarmed about their future supplies of steel that representations have been made to the Admiralty and a special conference has been convened for next week. Most of the yards are fully booked to the end of 1955 and any interruption in the flow of steel would seriously derange this programme. The Minister of Supply is himself partly responsible for these disturbing fears. Before the Recess he foretold a drop in steel production, and as heavy rearmament requirements are superimposed upon the current extensive demand for steel, stringency is bound to develop.

The British Iron & Steel Federation, however, takes a more hopeful view of the situation. They anticipate a slight drop in production. Their estimate is that the 1951 ingot output will be about 16,000,000 tons compared with the record of 16,293,000 tons, but after allowance is made for the curtailment of exports it is calculated that the tonnage of steel available for home use this year will be 14,430,000 tons which is about 250,000 tons more than last year. Better still they contemplate a steady expansion of blast furnace outputs during the second half of the year which should expand pig iron production by about 10,000 tons a week.

Transport of imported ores is still difficult. The upward trend of ore freights has not been arrested, but on the other hand "there should be a substantially increased usage of home ore from 12,777,000 tons to 14,300,000 tons provided the necessary coke is available."

On the whole the Federation considers that home supplies of steel will differ little from last year's level but is suggesting that more careful consideration should be given to competing claims in view of the fact that for the time being total supplies cannot be increased. While some form of allocation for steel may become necessary it would appear to be even more essential that there should be a clearer determination of the purposes for which steel is required. During the first four months of this year just under a 1,000,000 tons of iron and steel have been shipped abroad. The shipments have exceeded last year's figure by over 50,000 tons and the overseas demand is still insatiable. But exports are now strictly controlled, to answer fuller satisfaction of home requirements. The next step is the revision of prices and an early announcement upon this subject is now expected, since costs of production now far exceed the fixed maximum price levels.

Coal

The discovery of a rich new coal field at Sylen, on the eastern side of Gwendraeth Valley, near Llanelly, announced a few days ago by the South Western Divisional Coal Board, is an event of major importance to Britain's economy, and in particular to the future of the Principality. The significance of this announcement is enhanced by the fact that reserves in the big vein alone are sufficient for 50 years and that there are several other workable seams in the series.

Plans are now to be prepared to build a large-scale colliery which should eventually have an annual output of 1,000,000 tons of anthracite—a valuable earner of foreign currency, especially of Canadian dollars.

According to the Board's announcement "development work involved in a project of this size may take more than ten years to complete before the colliery can be brought into operation."

MAY 31 PRICES

COPPER

Electrolytic... .. £234 0 0 d/d

TIN

(See Metal Notes above for Thursday's Metal Exchange prices)

LEAD

Soft foreign, duty paid £160 0 0 d/d

Soft empire, including secondary lead £160 0 0 d/d

English lead £161 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid £160 0 0 d/d

G.O.B. spelter, domestic £160 0 0 d/d

Electrolytic and refined zinc £164 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over £390 per ton

Crude, (70%) £305 per ton

NICKEL

99.5% (home trade) £454 per ton

OTHER METALS

Aluminium, £124 per ton.	Palladium (scrap), /8 oz.
Bismuth, 22s. 6d. lb.	Platinum, £27/33 5s. nom.
Cadmium, 18s. 3d. lb.	Rhodium, /45 oz.
Chromium, 5s. 3d. lb.	Ruthenium, /30 oz.
Cobalt, 15s. 6d. lb.	Quicksilver, /73 10s./£74
Gold, 248s. f.o.z.	ex-warehouse.
Iridium, /65 oz. nom.	Selenium, 25s. nom. per lb.
Magnesium, 1s. 6d. - 2s. lb.	Silver (bar), 78½d. f.o.z. spot
according to quantity.	and forward.
Osmiridium, /35 oz. nom.	Tellurium, 19s. lb.
Osmium, /70 oz. nom.	
Palladium, /8 10s. oz.	

ORES, ALLOYS, ETC.

Bismuth	65% 15s. 9d. lb. c.i.f.
	50% 14s.
Chrome Ore—	
Rhodesian Metallurgical (lumpy)	£11 per ton c.i.f.
" " (concentrates)	£11 per ton c.i.f.
" " Refractory	£10 12s. per ton c.i.f.
Baluchistan Metallurgical ...	£11 11s. per ton c.i.f.
Magnesium, ground calcined ...	£26 - £27 d/d
Magnesite, Raw	£10 - £11 d/d
Manganese, Best Indian	(Nominal)
Molybdenite (85% basis) ...	(Nominal)
Wolfram (85%), U.K.	530s./540s. c.i.f. nom.
Tungsten Metal Powder ...	34s. 6d. nom. per lb. (home)
(for steel manufacture)	
Ferro-tungsten	32s. 6d. nom. per lb. (home)
Carbide, 4-cwt. lots ...	£30 3s. 9 d/d per ton
Ferro-manganese, home	£36 1s. 1d. per ton
Ferro-manganese, export	Nom.
Brass Wire	2s. 6½d.
Brass Tubes, solid drawn ...	2s. 0½d.

Mining Men and Matters

Mr. K. C. Acutt has joined the board of General Exploration Orange Free State.

Mr. A. Chester Beatty announces that his new address will be 10, Ailesbury Road, Dublin, Eire.

Mr. John A'Court Bergne has been appointed a joint managing director of Siamese Tin Syndicate and Bangrin Tin Dredging.

Mr. Bert Fredman has been appointed chairman of Robert Victor Diamonds.

Mr. William Herbert Harrison has been appointed a director of Amalgamated Anthracite Collieries.

Dr. Franz Kind has been nominated for the office of President of the North-Western Fuel Luncheon Club for the Session 1951-52.

Dr. John Williamson, the Tanganyika diamond mine-owner, was awarded an honorary degree from McGill University, Montreal, on May 28.

Conference on Mixing and Agitation in Liquid Media.—The Institution of Chemical Engineers will hold a conference on Mixing and Agitation in Liquid Media at the Royal Institution, 21, Albemarle Street, London, W.1, on July 17. Papers for discussion will include: "Recent Developments in the Theory and Practice of Agitation and Mixing," by Dr. D. M. Hewitt, and Messrs. G. C. Shipp and C. R. Black; "The Mixing of Coal with Liquids," by Mr. R. A. A. Taylor and "Practical Aspects of Liquid Mixing and Agitation," by Mr. Bryan N. Reavell.

Business Items

Mr. Richard Clements, for the past three years Press and public relations officer for Exide and its associated companies, is giving up this position from the end of June.

Mr. T. R. Taylor, of 51, Netherpark Avenue, Netherlee, Glasgow, S.4, telephone Merrylee 4213, has been appointed Scottish Representative of Follisain-Wycliffe Foundries and Variatio-Strateline Gears.

Mr. H. Willshaw, chief engineer of the Dunlop Rubber Co., is now in Canada to advise on further developments in the Toronto factory and will later visit the Dunlop works in Buffalo.

The Bank of Australasia has opened a new branch at 261, Flinders Lane, Melbourne.

The Paris Machine Tool Exhibition will be held at the Porte de Versailles, Paris, from September 1 to 10.

Commercial Bank of Australia has announced that the Lorne receiving office at Birregurra has been converted into a branch. It has also opened a branch at Civic Centre, 405, Hunter Street, Newcastle, New South Wales.

The Dunlop Rubber Company at the Birmingham Industrial Safety Exhibition, Bingley Hall, May 30-June 2, are showing safety boots giving a toe clearance of at least two-thirds of an inch to an impact of 150 lb. ft., anti-acid boots, elbow and knee pads to prevent miners' "Beat knee" and "Beat elbow."

S.W. African Diamond Exports.—The value of diamonds exported from South-West Africa increased from £2,941,928 in 1949 to £5,952,190 last year.

Kenya Mineral Output for 1950.—Kenya Mineral Production figures for 1950 are as follows (gold and silver in f.o.z., all other figures in 1 tons): gold (refined), 22,945.96; silver (refined), 2,585.76; salt, 18,426.00; kyanite, 10,195.00; lime, 12,103.00; diatomite, 2,572.00; asbestos, 225.00; soapstone, 318.00; eburru clay, 1,286.00; talc, 10.00; limestone, 1,754.00; magnesite, 178.00; mica, 1.00; corundum, 1.75; vermiculite, 3.50.

British Guiana Gold and Diamond Output.—The British Guiana Department of Land and Mines send us figures of the Colony's output of gold and diamonds for the first quarter of the year, with the corresponding figures for the same period of 1950: gold, 2,110 oz. (3,190 oz. in 1950); diamonds, 72,115 stones, yielding 8,040 ct. as compared with 56,345 stones, yielding 6,636 ct. in the first quarter of 1950.

Southern Rhodesia's Mineral Output in 1950.—Southern Rhodesia produced the following minerals in 1950: gold, 511,163.02 f.o.z.; silver, 85,549.29 f.o.z.; coal, 2,345,841 tons; arsenic, 125.70 tons; asbestos, 71,526.82 tons; chrome ore, 321,352.78 tons; fireclay, 1,363.00 tons; iron ore, 63,070.20 tons; iron pyrites, 15,223.00 tons; kaolin, 15,239.50 tons; beryllium, 932.44 tons; limestone, 282,703.91 tons; feldspar, 3,880.00 tons; magnesite, 9,495.50 tons; mica (block), 84 tons, 267 lb.; quartzite, 821.98 tons; tin (concentrates) 105.40 tons; vermiculite, 784.26 tons, tungsten (concentrates), 64.97 tons.

The Mining Markets

(By Our Stock Exchange Correspondent)

Although markets generally have been quieter this week, prices have held up remarkably well. Glits have been no exception and a better tendency, initially started by a certain amount of bear covering, was clearly discernable towards the end of the period.

Kaffirs mostly showed all-round improvements despite lack of interest in Johannesburg. West Driefontein were a good feature; they rose 7s. 6d. on the week, following rumours of good developments. Consolidated Murchison were strong on the figures announced for the first quarter of 1951. Estimated gross profit from the sale of 5,594 short tons of concentrates was £538,315 and taxation £139,000. The discovery of high grade deposits at the Gravelotte section has greatly extended the antimony ore reserves. This factor, together with increased facilities at the mine, has increased production to three times the 1949 figure. These results more than fulfilled all previous market rumours and phenomenal profits are anticipated for the year 1951. Much of course depends on the continued high price of antimony, for which the severing of Chinese supplies is partly responsible. Consolidated Murchison is among the world's largest producers of the metal.

Little interest was displayed in the West African market which still remains torpid. London and African Mining were a shade harder on the reported proposals for amalgamation with National Mining. No details have yet been received. Konongo fell away sharply on the failure of the main Odumase ore body at the twentieth level. If results continue negative no further sinking will be done for the present. The importance of the Boabedro ore shoot could not yet be assessed, and the chairman

emphasized the necessity to keep the company in a strong liquid position.

Diamond shares jumped following strong buying as a result of unofficial reports that sales of stones are running at an even higher level than last year, itself an all-time record.

Coppers had a good week after the Ministry of Supply announcement that the price to domestic consumers would be raised by £24 a ton to £234. Rhokana were particularly popular. Some sections of the market estimate that these heavy shares have been left behind in the recent sharp advances and that to-day they are undervalued in relation to the rest of the market. Rio Tinto and Tharsis fell away on further consideration of Spanish exchange difficulties. Tanks reacted following the announcement of the Union Miniere dividend. The directors of this latter company propose paying a final of 350 Belgian francs, making a total of 750 for the year. This compares with a single payment of 480 francs for each of the two preceding years. The optimists had been going for a final dividend of 600 francs.

Among dollar shares interest revived in International Nickel. The company announced net earnings for the March Quarter equivalent to 97 cents per common share, compared with 98 cents for the December quarter, and 58 cents for the first quarter of 1950. The company also stated that new wage contracts had been negotiated and later announced an increase in the price of nickel of £48 to £454 per ton. This results from the considerable rise in working costs.

Oils were a particularly firm section, although the actual turnover was moderate. Anglo-Iranian were better following rumours that the Persians were likely to negotiate. Mexican Eagles, however, fell away on rumours from Paris that the Mexican Government might discontinue payments under the scheme.

FINANCE			MISCELLANEOUS GOLD			TIN (Nigerian and Miscellaneous)		
	Price	+ or -		Price	+ or -		Price	+ or -
African & European	May 30		Alpha F.S.A.	15/-		Amalgamated Tin	11/4d	+41d
Anglo American Corp.	8 1/2	-	Blinkpoort	26/3		Beralit Tin	23/6xd	-104d
Anglo-French	24 1/4	+7 1/2	Central Mining F.S.	16/-	-3d	Bischi	4/9	-
Anglo Transvaal Consol.	46/3		Freddie's	16/-	-3d	British Tin Inv.	18/-	+6d
Camp Bird	13/6		Freddie's N.	11/7 1/2	+7 1/2	Ex-Lands Nigeria	7/9	+3d
Central Mining (f1 shrs.)	46/10xd	-7 1/2	Freddie's S.	13/4	+4 1/2	Geveor Tin	18/-	-
Consolidated Goldfields	2 1/2	+ 1/2	F.S. Geduld	3 1/2	+ 1/2	Gold & Base Metal	4/11 1/2	+3d
Consol. Mines Selection	37/6		Geoffries	3 1/2	+1 1/2	Janita Nigeria	7/3	+3d
East Rand Consols.	4/6		Harmony	25/3	+3d	Los Tin Area	11/3	-
General Mining	61/3xd		Lydensburg Estates	11/3		Kaduna Prospectors	4/3	-
H.E. Prop.	40/-	-1 1/2	Middle Wits	25/-	+6d	Kaduna Syndicate	6/6	+3d
Henderson's Transvaal	10/9		Ofsets	2 1/2		London Tin	5/3xd	-3d
Johnnies	3 1/2	-	President Brand	22/3	-3d	Ribon Valley	1/4d	-
Rand Mines	21	-	President Steyn	18/3		United Tin	3/-xd	+1 1/2
Rand Selection	43/9	+7 1/2	St. Helena	33/1 1/2				
Union Corporation	11 1/2		U.F.S.C. & G.	10/-				
Vereeniging Estates	4 1/2		Virginia Deb.	77				
Wits	34 1/4	+1 1/2	Virginia Ord.	15/1 1/2	+1 1/2			
West Wits	2 1/2	+ 1/2	Welkom	41/3	+ 1/2			
			Western Holdings	3 1/2	+ 1/2			
RAND GOLD			WEST AFRICAN GOLD			SILVER, LEAD, ZINC		
Blyvoor	53/1 1/2	+7 1/2	Amalgamated Bank	2/7 1/2	-1 1/2	Broken Hill South	59/6	-3d
Brakpan	21/9		Ariston	7/4 1/2	-1 1/2	Burma Corporation	4/7 1/2	+7 1/2
City Deep	2 1/2	-	Ashtani	30/3	+3d	Consol. Zinc	36/9xd	-3d
Consol. Main Reef	2 1/2	-	Bibiani	11/9	-3d	Lake George	28/9	-
Crown	4 1/2	-	Bremang	3/8	-	Mining Trust	5/14xd	-1 1/2
Dagaa	3 1/2	-	G.C. Main Reef	4/-	-	Mount Isa	48/-	+6d
Dominion Reefs	27/6		G.C. Section Trust	10/9	-3d	New Broken Hill	30/6xd	+6d
Dorfontein	2/6	+1 1/2	Konongo	2/-	-6d	North Broken Hill	77/3	-3d
Durban Deep	4 1/2	-	Kwahu	2/6	-	Rhodesian Broken Hill	23/3	-6d
E. Dagaa	27/6		London & African Mng.	2/10 1/2	+1 1/2	San Francisco Mines	76/3xd	+3/9
E. Geduld (4/- units)	2 1/2	-	Lydthurst Deep	1/-	-	Trepca	4/-	-
E. Rand Prop.	4 1/2	-	Marlu	2/9	-			
Geduld	8 1/2	+ 1/2	Maru	2/9	-			
Grootvlei	42/6		Tagush & Abosso	1/-	-			
Libanon	17/6			7/6				
Lipapards Vlei	24/6							
Marievale	23/9							
Modderfontein B.	6/-	-						
Modderfontein East	18/-	-						
New Kleinfontein	36/10 1/2							
New Pioneer	27/6							
Randfontein	21/3	-						
Robinson Deep	15/9	-						
Rose Deep	42/6							
Simmer & Jack	7/-	-						
Springs	11 1/4	+ 1/2						
Sub Nirel	3 1/2	-						
Van Dyk	16/6							
Venterspoort	32/6							
Vlakfontein	18/-	-						
Vogelstruif	28/3	-						
West Driefontein	6 1/2	-						
W. Rand Consolidated	47/6							
Western Reefs	41/10 1/2	+7 1/2						

Company News & Views

Further Implications of the Finance Bill

Time and again, *The Mining Journal* has described what the consequences would be to this country if a mass exodus of companies, particularly U.K. controlled overseas mining companies, should take place. But this does not mean that because the Finance Bill will effectively prohibit the transference of control of companies to centres elsewhere that we are in favour of it reaching the Statute Books. On the contrary, Section 32 of the Bill dealing with domicile, creates a ring fence around these Islands, which is not only a restriction on the liberty of the individual but runs counter to our trading and commercial interests. In short, it is merely an attempt to deal with the bad effects of past fiscal policy which has given rise to the desire of U.K. controlled but non-resident companies to transfer their seats of management elsewhere. On several occasions it has been pointed out in *The Mining Journal* that by leaving untouched the present ill-devised and anomalous taxation code under which British overseas mining companies operate—and even more by prohibiting emigration as is now proposed—no fresh mining enterprises will consider establishing themselves in this country. The natural corollary of this misguided policy is that the U.K. will, as the years pass, exercise control over ageing and therefore depreciating resources, while the new and virgin deposits discovered will come under the control of other countries whose taxation laws provide relief commensurate with the risk involved in developing new mining enterprises.

However, not only does the Finance Bill provide no solution to our mining companies immediate problems; it also takes no account of the effects which it will have on policies of those countries in which U.K. controlled mining enterprises are located.

The large number of British overseas mining companies are located in the so-called under-developed countries, such as parts of Africa, Malaya, Borneo, etc. It is in these countries where the growth of national sentiment in the post-war period has been strongest, and where there is a great desire to develop indigenous resources for the benefit of the local inhabitants.

While the day is not yet when these countries can dictate terms to the U.K., events on the west coast of Africa and in Rhodesia suggest that it may not be so far off. In the meanwhile, these local Governments are faced with the situation that despite the fact that the mining enterprises are working in their territory, the primary right to tax their profits is vested in the U.K. If the local Government's plans to develop their own economies are to be realized, it is not unnatural for the local administrators to view all industries within their borders, whether they be controlled locally or not, as legitimate sources of revenue. The imposition of a gold duty such as took place in Mysore, India, with regard to the Kolar goldfield group of mines, well illustrates this point. No doubt it would be possible by means of taxation reliefs, to relieve companies of some of the burden of increased taxation however levied, but if continued there must come a time when a further loss of revenue to the U.K. Treasury would be resisted. The net result, should this happen, would be that the mines would come under a taxation fire from both the U.K. and the local Governments, with the probable consequence that the mines' development programme will be curtailed and production diminished.

Assuming that the growth and development of the under-developed territories depends upon the development of their natural resources, these countries, as they gradually achieve autonomy, will under the restrictions now to be placed on the migration of British companies,

in all probability resort to nationalization, where otherwise with the freedom to emigrate hitherto available to British companies, some compromise solution such as we recently witnessed in the Kolar Goldfields might instead be reached.

There are many who will no doubt consider that this is carrying the argument too far, as the so-called under-developed countries would be unable to find the capital necessary to meet the compensation involved in nationalization. But this is to view the problem too narrowly, for it is not unheard of for nationalization to take place and compensation to be paid from the profits of the enterprises so nationalized, over a period of time.

Anglo American Launches Quarterly Review

The Anglo American Corporation has always been notable among mining groups on this side of the Atlantic for its endeavours to inform shareholders more closely about the nature and extent of the business which they own. Nor is it any easy task to bring home to people who may be quite unfamiliar with mining processes, the nature and extent of the technical problems to be solved or the amount of capital and the complexity of organization required to deal with them.

Anglo American's latest step towards putting shareholders in the picture is now to be seen in the form of a new quarterly review called *Optima*, the first volume which has just reached London from Johannesburg. Published by the Corporation and associated companies, notably De Beers, and intended primarily as a service to the shareholders of the companies concerned, this new and interesting journal will have a wide private circulation. Copies are being sent to 33,500 individual shareholders in Southern Africa, to 80,000 individual shareholders in the U.K. and elsewhere in the British Commonwealth and to 7,250 individual shareholders in the U.S.A. and other foreign countries. A small number of copies will be made available for sale to the general public in South Africa and in the U.K.

In a foreword to the inaugural number of *Optima*, Sir Ernest Oppenheimer says it will be the purpose of the journal to focus attention on the diverse factors which influence the shaping of policy and the scope of operations.

"The rapid industrialization now in progress in Southern Africa has brought in its train new problems and has aggravated some that were inherent in the complex social and economic structure of the sub-continent. The progress of these territories will be governed by the way in which these problems are handled and resolved. The fortunes of our own companies are likewise intimately bound up with the outcome of current controversy about major public policy. It is important that the issues, as they arise, should be seen clearly and in perspective."

Among the articles contributed to *Optima* in its inaugural issue, is one by Mr. E. B. Papenfus, entitled "The Importance of Borehole Results in Prospecting and Developing a New Gold Field," and another by Professor C. S. Richards, whose article on "Devaluation and Its Effects on the Gold Mining Industry" analyzes the effects of devaluation and the rising costs upon the gold mining industry.

Forthcoming Kaffir Dividends

The June half-yearly distributions by the Rand gold mining companies are expected to make a satisfactory showing generally. Of the 44 producers, dividends are anticipated from 37, the same number as in June of last year, when an aggregate of £12,624,468 was distributed.

It has been foreshadowed by the chairmen at recent annual meetings in Johannesburg that lower payments may be made by certain mines. Working profits of all the producers for the first four months of the current

year are below those of the corresponding period of last year, with the exception of Blyvoor, Libanon, South African Lands and Vlakfontein. Additional revenue from premium gold may, however, have made up to some extent the lower revenue.

At the meeting last month of Vlakfontein, the chairman disclosed that a lower dividend was likely as a result of capital expenditure requirements and the prospect of sharply increased taxation. Another member of the Gold Fields group expected to make a drastic cut in payment is Robinson Deep. Sub Nigel may repeat its December amount (5s. 9d.) as also Venterspost (1s. 1d.); Rietfontein, Simmer & Jack and Luipaards Vlei should pay the same as in June of last year; "Vogels" may pay 1s. There is still a wait for holders of Libanon before the dividend paying stage is reached; at the meeting last November the chairman said that profits for the year to June 30, 1951, would have to be allocated for capital expenditure.

Blyvoor's profits for the four months of the current year have amounted to £2,362,000 against £2,149,000 in the corresponding period of last year when the dividend was stepped up from 1s. 2d. to 1s. 4d. and repeated in December last. A small increase could be made. Of the other Central Mining producers, the substantially lower profits for the January-April period of this year compared with the corresponding period of 1950, the possibility of lower payments by Crown Mines, City Deep, East Rand Proprietary and Modder East. Con. Main Reef may pay 4s, Durban Deep 3s. and Rose Deep 3s. 3d.

In the Anglo American list, South African Lands is expected to continue its sequence of increased payments started in December, 1949, when the previous amount of 6d. was doubled; a June distribution of 1s. 9d. against 1s. 7½d. last December is looked forward to. Brakpan and Springs, whose profits are down, may yet be able to repeat the amounts paid last June. Daggafontein's lower revenue may not enable it to repeat its 3s. 3d. even though East "Dagga" (in which it is interested) again pays 1s. 9d. Western Reefs may distribute 1s. 3d.

Geduld should pay 8s. as in June of last year and East Geduld 2s. 3d., provided Grootvlei (in which they both hold shares) does not distribute less than in June last. The other producer of the Union Corporation group, Marievale may pay 1s., but a re-entry into the list of Van Dyk is not expected.

Most of the "Johnnies" companies are relying on premium gold to keep them going. Government Areas, New State and East Champ d'Or may repeat their December amounts. The forewarning that Randfontein has to meet increased tax liability may have been made in anticipation of a smaller distribution than the 1s. 6d. paid for each of the past half-years. Rand Leases may pay 2s. and West Rand 1s. 3d.

Selection Trust's Increased Earnings

An advance in gross earnings from £933,517 to £1,404,288 is shown in the consolidated profit and loss account of Selection Trust for the year ended March 31, 1951. One of the features contributing to this rise in earnings was a jump in income from dividends from £731,742 to £1,051,941, which was principally due to the commencement of dividend payments by Tsumeb Corporation and to larger distributions made by the American Metal Co. and Consolidated African Selection Trust. After providing for expenses and U.K. and South African tax net profit advanced to £783,878 against £488,436 previously.

From the £1,025,528 (£708,605) available, £300,000 against £200,000 was placed to revenue reserves, the sum of £388,215 was required to meet the dividend payments which were stepped up to 32½ per cent against

20 per cent, and after taking into account an amount of £25,250 required to service preference dividends of a subsidiary company, the unappropriated profits of Selection Trust at its fiscal year-end was £86,857 against £87,770, while the forward balance of its subsidiary companies increased to £223,206 against £151,906 in the preceeding year.

Selection Trust through its holdings both direct and indirect in Rhodesian Selection Trust, Roan Antelope, Consolidated African Selection Trust, American Metal, Western Holdings, St. Helena, Trepca and Ultramar participated in the copper, diamond, lead, zinc, gold and oil industries. Thus results for the current year, insofar as investment revenue is concerned, appear even better than for the year under review. The copper supply position remains tight. Rhodesian Selection Trust and Roan Antelope have declared higher interim dividends. Indications are that diamond turnover this year will be a record one, St. Helena will be in production in the latter part of this year while Ultramar's output of around 22,500 bbl. per day has been the principal factor in the market value of this company's shares appreciating three-fold over the past year. Furthermore, dividends so far announced by American Metal for 1951 are double those declared for the same period in the previous year.

Although investments stand in the latest balance sheet at £2,963,439 against £3,255,292, the directors state that their aggregate market value was substantially in excess of their book value. Revenue reserves and surplus have increased to £1,231,289 against £896,992. Current assets are also higher at £2,973,852 (£2,250,788), while current liabilities and provisions amount to £413,080 compared with £317,132 previously.

Increased Operating Costs at Paringa

Although Paringa & Exploration Co. suspended milling operations on January 16, mainly because of ever increasing costs, an intensive programme of geological investigation and underground diamond drilling is still in progress. The object of this programme is to test all possibilities within the company's areas and especially to locate any extensions of the main ore shoots which have in the past been the sources of high grade ore.

During the seven and a half month period ended mid-April, 1951, 3,609 ft. of development work, including shaft sinking, and 14,605 ft. of diamond drilling had been accomplished at a cost of £A.48,000. While some promising values have been exposed, development generally has so far only produced relatively small tonnages of high grade ore, which are at present insufficient to justify a resumption of milling operations. A notable development feature has been the good values obtained on the deepest horizon ever prospected in the history of the mine, namely the 1,300 ft. level. But this is entirely in calc-schist and it is necessary to carry out further drilling to assess the importance of this new discovery.

It has been decided not to proceed further with any mining operations at present on the property of the Mount Charlotte Mines. In this connection the chairman, Mr. Charles S. Beale, in his review accompanying the report and accounts stated that it was a great disappointment that the Wiluna Gold Mines relinquished their option to purchase the Mount Charlotte Mines in which Paringa has a substantial interest, after Wiluna Gold had expended approximately £A.200,000 on its development. In view of the cessation of development work at Mount Charlotte, no further drilling operations will be undertaken in the Maritana areas.

The report and accounts show that despite the fact that revenue from gold proceeds amounted to £220,808 against £213,676 for the previous year the company suffered a loss of £34,606. This latter figure, however, included the

sum of £50,242 in respect of the Australian Federal Government assistance, which, since devaluation, is no longer available to the company. Continuous increases in operating costs deprived the company of the benefits from the higher price of gold and these costs are now at a figure which has rendered uneconomic the milling of a grade of ore of 4.20 dwt. per lton.

Over the past two years ore reserves have declined from 152,675 ltons of an average grade of 5.24 dwt. to the present tonnage of 91,850 ltons of an average grade of 5.08 dwt. per ton.

British-Borneo Petroleum's Increased Profits

After providing £142,250 in taxation, profit for the year ended March 31, 1951, of British-Borneo Petroleum Syndicate amounted to £106,228 against £93,972 in 1949. Out of this a dividend of 16½ per cent tax free was paid (13.9 per cent), absorbing £41,667. Reserves were strengthened. Investment reserve received a further £15,000 and general reserve received £45,000 (£40,000). The carry forward amounted to £37,823 which compares with the £33,262 brought forward last year.

At the annual meeting to be held on June 9 next, shareholders will be asked to approve a resolution to increase the authorized capital from £250,002 to £300,002 and to capitalize £49,998 of the company's reserves by the issue to stockholders of one 6s. unit of stock, credited as fully paid, for each five 6s. units of stock held.

The company's main source of revenue is derived from its royalties on the production of oil by British Malayan Petroleum, a Royal Dutch-Shell subsidiary, on its Seria Oilfield in Brunei, British Borneo. Production in this field has steadily expanded since the war and in 1950 it produced about 4,500,000 tons making it the largest producing area in the British Commonwealth. The company also owns (*inter alia*) a substantial interest in Apex (Trinidad) Oilfields and interests in oil and other companies.

Company Shorts

Harmony's Borrowing Powers to be Doubled.—Harmony Gold Mining Co. in a circular to shareholders, has announced that at an extraordinary general meeting to be held on June 29, 1951, it will be proposed that the company's borrowing powers be increased from £1,000,000 to £2,000,000.

The directors, the circular states, are of the opinion that for the present it would be preferable to continue to operate on short-term loan facilities. By increasing the borrowing powers, the company will be able to finance operations for a further period during which the necessary arrangements will be made to raise additional capital.

Siamese Tin Compensation.—Bangrin Tin Dredging and Siamese Tin Syndicate have announced that the following sums have been received by them in final settlement of their respective claims against the Siamese Government concerning damage to their properties.

Bangrin has received £105,427 and 2,201,938 ticals (approximately £38,294). Siamese has received £274,263 and 6,005,522 ticals (approximately £104,444). The ticals are being used to repay advances totalling these precise figures, which were made available to the company by the Siamese Government for rehabilitation in the years 1947 and 1948.

New Union Gold Accepts Scheme.—After examining several offers put forward by various groups to release New Union Goldfields from judicial management, it has now been officially announced that the scheme put forward by the Merchants' for Industrial Corporation was accepted at an extraordinary general meeting of New Union held last week by a majority of 3,449,292 votes.

The Merchants' Industrial Corporation's offer was for the provision of new funds of £522,500 by the issue of 1,900,000 New Union shares at 5s. 6d., and of a further £100,000 by the issue of 5 per cent Ten Year Unsecured Notes. Shareholders of New Union would participate in the share issue in the ratio of three shares for every ten held and in the Note issue on a *pro rata* basis to their holdings.

In the event that Treasury permission is withheld for the U.K. portion of the issue, the Corporation proposed that shareholders on the London register be granted a free option up to May 31, 1952, to take up 15 shares at 5s. 6d. for every 100 held.

GENERAL EXPLORATION ORANGE FREE STATE

(Incorporated in the Union of South Africa)

The Fifth Ordinary General Meeting of General Exploration Orange Free State, Ltd., was held on May 15 in Johannesburg.

Mr. C. S. McLean, who presided, said in the course of his speech: During the year under review a programme of drilling on various properties in the Orange Free State in which your company is interested was continued and a total of 80,646 ft. was accomplished. An area of 6,888 morgen was abandoned during the year owing to no favourable indications having been obtained as the result of drilling in those areas. Against this, however, further mineral right options over 18,696 morgen were acquired in the Bothaville and Kroonstad districts.

The drilling of 80,646 ft. to which I have referred was spread over 19 holes sited to explore the possibilities of intersecting payable gold reefs. In three of the holes, VDH.4, Spes Bona 1 and WN.3, the basal reef was intersected, while five holes on and adjoining the farm Weltevreden No. 205 intersected coal seams. The results obtained through the year's operations did not disclose any additional information of great value to your company, but events since the close of the year have changed the outlook considerably.

BALANCE SHEET

The balance sheet shows that the balance on share premium account at December 31, 1949, amounting to £233,210, has been transferred to appropriation account, of which £150,441 was utilized to write off expenditure incurred on areas which had been abandoned by the company at December 31, 1950.

An amount of £52,677 was used to write down the value of investments, where necessary, to market value at December 31, 1950, and the balance remaining of £30,092 was transferred to exploration reserve. The value of the investments at £376,217 compares with £221,110 at the end of the previous year.

As a result of discussions which had taken place, an offer by Anglo American Corporation of South Africa Ltd., to subscribe for 500,000 new shares at 24s. per share was received towards the end of last month.

It was considered by your board that this offer provided the best means of ensuring sufficient funds to meet the company's requirements for some time to come, and that the interests of stockholders would be best served by accepting it. Notification of the issue of these new shares was given in the Press on April 20, 1951, and by circular dated May 10, 1951, posted to stockholders.

PAYABLE VALUES DISCLOSED

As stockholders are aware, the most important results obtained from the drilling activities of your company from inception up to the end of the year 1950 have been obtained in three boreholes, VDH.1, TV.2 and K.1, which have indicated a strike of payable reefs in the Elsburg series and basal reef of not less than 14,000 ft. In addition, the "B" reef in borehole K.1 assayed 34.2 dwt. over 5.56 in. (corrected width) and, in TV.2—8.1 dwt. over 31 in., and, in a duplication, 12.6 dwt. over 48 in., while the "A" reef in the latter hole assayed 3.3 dwt. over 66 in.

The results of boreholes Spes Bona 1, VDH.4, VDH.4a and WN.3, although proving that the area is underlain by basal reef, failed to disclose payable values in the upper reefs. In borehole WN.3 the horizon of the upper reefs was cut out by faulting.

The recent results, which have been published in the Press, from boreholes TV.3 and BH.1 on Rosedale have been most gratifying, and the values revealed in the various reefs in the Elsburg series are comparable with the values obtained in the three previous boreholes, VDH.1, TV.2 and K.1. As you know, TV.3 is situated 500 ft. to the west of the TV.2-VDH.1 line, while BH.1 on Rosedale is on an extension of that line 7,000 ft. to the south of VDH.1.

LATEST INFORMATION

The latest position in the three boreholes being drilled on behalf of your company on joint account with Middle Witwatersrand (Western Areas) Ltd., on May 14, 1951, was:—

TV.3 on S.D.1 (Tevrede) of Spes Bona No. 921—depth 6,785 ft. in sediments.

WN.5 on Weltevreden No. 205—depth 5,162 ft. in sediments.

Borehole 1 on Rosedale No. 898—depth 5,585 ft. in sediments.

The latest information available concerning the three boreholes being drilled by Middle Witwatersrand (Western Areas) Ltd. on joint account with your company, on the farm Van den Heeverst No. 419 is as follows:—

VDH.4A has reached a depth of 5,982 ft. in a deflection starting from 5,690 ft., and is now in an intrusive. Considerable difficulty is being encountered owing to caving.

VDH.5—depth 3,333 ft. in lava.

VDH.6—depth 1,540 ft. in lava.

The proceedings of this meeting will not be circulated to stockholders, but copies may be obtained on application to the head office in Johannesburg, or to the London office.

The motion for the adoption of the report and accounts was carried unanimously, and the retiring directors, Mr. E. L. Lloyd, Mr. C. S. McLean and Mr. J. A. Young, were re-elected.

CENTRAL MINING & INVESTMENT

The Forty-Sixth Annual General Meeting of "The Central Mining and Investment Corporation Ltd.", was held on May 29 at 1 London Wall Buildings, London, E.C.

Sir Clive Baillieu, K.B.E., C.M.G., the Chairman, presided. The following is an extract from his statement:—

Since we met last year you have had placed before you in the directors' report the results of the gold mining industry in South Africa and of the Central Mining/Rand Mines group for the first full year since the devaluation of the £ in 1949.

The improvement after devaluation in the Union's economic position which was already noticeable at the end of 1949 was maintained throughout 1950. Together with the benefits of devaluation the continuation of the full import control measures imposed during the second half of 1949 helped the country to check the unfavourable trend in its balance of payments and to build up substantial reserves. Imports showed a small decline in 1950 while, on the other hand, and principally on account of the devaluation of the South African pound, the Union's total exports of merchandise, including processed and semi-processed, or non-monetary, gold, increased in 1950 by £91,000,000 to about £248,000,000. Even excluding gold products there was still an increase of about £63,000,000, of which the wool trade accounted for £27,000,000 and the diamond trade for £10,000,000. If the published trade figures are adjusted to take account of the territory of South-West Africa and of other balance of payments factors, it would seem that the Union's total external currency deficit, excluding gold and gold products, declined from about £228,000,000 in 1949 to about £153,000,000 in 1950. Including gold and gold products, the value of which, enhanced as a result of devaluation, amounted to about £147,000,000, the Union's net current deficit abroad dropped from about £114,000,000 in 1949 to about £6,000,000 in 1950.

On capital account also the Union continued to show a strong favourable balance in 1950. Although the rate of capital inflow tended to decline during the year from the high point of the first quarter the total inflow amounted to about £77,000,000, as compared with £53,000,000 approximately in 1949. It is important to note that of the £77,000,000 in 1950, about £21,500,000 came from outside the sterling area, compared with about £2,000,000 in 1949.

I expressed the hope last year that the upward trend in native labour noticeable in 1949 would be continued and that the number of Europeans would be increased. For the first quarter of 1950 the favourable trend continued, but unfortunately the number of natives employed on the mines fell off very considerably during the latter part of the year when the seasonal decline reached serious proportions. Labour costs, of course, showed a substantial increase over the figures for 1949, and the cost of stores rose through the considerable increase in the prices of raw materials.

The most serious effect of the persistent upward trend in working costs is the exclusion of previously payable ore from the reserves of the industry. The higher cost level also affects adversely the conduct of mining operations in that if the search for higher grade ore has to be intensified the selective process involved tends to make operations more expensive and less fruitful.

Operations were handicapped in 1950, as indeed they were in 1949, by shortages of essential materials, particularly steel, and by delays in the delivery of equipment from overseas. During the course of the current year South African production of steel is expected to increase steadily as the new Iscor Works come into production. While this will provide a certain welcome measure of relief we must expect, under present world conditions, that steel is likely to remain in short supply. There has also been a noticeable aggravation of the problem of electric power supply. During the early months of 1950 the supply was satisfactorily maintained by the Electricity Supply Commission, but a shortage developed later in the year, due to lack of generating equipment to meet increasing demands. The extent of this shortage, which is likely to continue until further power stations are brought into operation, cannot yet be assessed. The industry is considering ways and means of alleviating the effects and the Government has rendered valuable assistance in this connection by agreeing to Sunday milling as a temporary measure for certain mines, not hitherto allowed to mill on Sundays, which, due to shortage of power, will have to curtail milling during weekday mornings. We may well find that this shortage of power may adversely influence operations, particularly in the Orange Free State, in the next few years.

The industry, however, can point to some solid achievements in 1950. The tonnage milled on the Witwatersrand was the highest since 1943. Although, through a reduction in grade, the number of ounces produced decreased, the working revenue rose to over £140,000,000 inclusive of the premium obtained on part of the production. These sales at a premium reflect the demand for gold in processed or semi-processed form. During the first half of 1950 premium sales diminished steadily in volume and the amount

received as premium for the second quarter of the year totalled only about £100,000. Since last June, however, the demand has become much keener and for the whole of the year the premium amounted to over £2,000,000. In 1951 this demand has been sustained and the premium for the first quarter represented an addition of some 17 per cent to profits before taxation.

In the Orange Free State section of the Witwatersrand gold-field remarkable progress has been made upon the new gold mining properties to which I referred last year.

There are now 17 developing mines from the West Driefontein mine adjoining our Blyvooruitzicht mine to the southern boundary of the Merriespruit property beyond our Harmony mine, at the extreme south of the Orange Free State gold-bearing region. It is desirable to consider the significance, particularly from the labour point of view, of this tremendous programme of expansion. When, early in 1949, the Government mining engineer submitted his valuable report upon future gold production to the Commission on Conditions of Employment in the Gold Mining Industry he analysed the position in the light of circumstances differing substantially from those which now prevail. Devaluation of the £, with its beneficial influence upon the operations and life prospects of existing producers, had not occurred and it was a reasonable assumption that the new companies then envisaged could be served by the labour released from the gradual exhaustion of the older mines. In other words, the future labour supply and requirement were expected to be in rough equilibrium. Now, however, the old producers will need full labour forces for longer periods than expected if they are to be allowed to work to best economic advantage and to maximum economic depth and to win the utmost quantity of gold.

Within our own group the results for 1950 have, as you know, been satisfactory. I shall refer to only a few of the mines individually, but I should like again to draw your attention to the influence of the six great companies on the Central Rand all under our administration, which produce 23 per cent of the total tonnage of the industry. These companies are not only contributing largely to present gold production but they are also affording valuable experience of deep level mining. The maximum depth of mining at the end of March last was 9,250 ft. below surface at Crown Mines, 8,900 ft. at City Deep, 8,400 ft. at E.R.P.M., 8,000 ft. at Consolidated Main Reef, and 7,900 ft. at Durban Deep. These five mines, together with Rose Deep, paid out £4,230,000 in dividends last year, and it may reasonably be estimated that there remains to be recovered from them a total of some 250,000,000 tons of ore for a yield of 45,000,000 oz. of gold. This serves to emphasize the importance of maintaining the labour supply adequate to meet the needs of the mines of the Central Rand.

The operations of the group mines as a whole were substantially influenced by the results at the Blyvooruitzicht mine and, indeed, the increasing influence of the mines of the West Wits line on the results of the whole industry was again apparent in that the three producing mines in this area—namely, Blyvooruitzicht, Venterspost and Libanon—accounted for nearly 17 per cent of the total working profit of the 43 major gold mines of the Transvaal.

In the Orange Free State, operations on our Harmony mine are progressing satisfactorily.

In common with, I imagine, all other British companies with overseas interests, we deplore the trend of United Kingdom taxation legislation as evinced by the Finance Bill recently laid before the House of Commons by the Chancellor of the Exchequer. The necessity for continued restraint in the payment of dividends which has been so widely observed as a voluntary measure is made the pretext for a substantial increase in the rate of profits tax on all distributed profits, not merely on such portion of them as represents an increase in the distribution. Moreover, the impost in itself is recognized as unjust since it singles out business profits for additional taxation, which, in effect, falls entirely on one category of shareholder. A vicious innovation is proposed in that the Commissioners of Inland Revenue are to be given power, after the event, to adjust liability to the profits tax as they may think appropriate if their opinion is that any transaction was arranged with a view to minimising liability to tax. This is well on the way towards the methods of dictatorship and is wholly unacceptable.

The Finance Bill also makes provision to prevent British companies transferring their "residence" to places abroad or to raise capital for overseas subsidiaries without Treasury permission. Restrictive legislation of this type will, in my opinion, defeat its own object, which, it must not be overlooked, is to maintain the public revenues of this country. Surely the proper way to deal with this problem, if problem there be, is to create the conditions which will remove the desire of some companies to change their residence? Have we so soon forgotten the lessons of the nineteenth century when we found that you did not stop a run on a bank by refusing to pay out its depositors? The City of London still offers many advantages as a centre from which overseas mining and other enterprises may be financed and developed.

The report was adopted.

THE STRAITS TRADING CO., LTD.

DIVIDEND INCREASED TO PRE-WAR LEVEL

At the Annual Meeting of The Straits Trading Co., Ltd., held in Singapore on May 23, 1951, the Chairman, **The Hon. Mr. E. M. F. Fergusson**, who presided, said:

The Report and Accounts for the year ended December 31, 1950, having been in your hands for the prescribed time I shall, with your permission, take them as read.

The quantity of ore which was available to the Malayan smelters was in close accord with the forecast I made when I addressed you a year ago. The total was some 87,000 tons in comparison with 83,000 tons in 1949. I expect little change to take place this year and generally I see no developments in the foreseeable future which are likely to increase the supply of ore, particularly in Malaya.

NEED FOR DEVELOPMENT

There has been as most observers already know, insufficient development during the past twenty years to replace the resources used up during that time. The low price of the early 'thirties discouraged prospecting, and for a period it was prohibited as part of the restriction scheme. Then there was the hiatus caused by the Japanese occupation and also the immediate post-war period when the emphasis was rightly on repair and replacement of plant. Now we have the distressing current conditions of lawlessness which have brought exploration and prospecting practically to a standstill.

Even current production is affected by the existing conditions and, while no large producers have been forced to shut down because of them, many areas are affected by the extremist elements, and small mines in many isolated parts of the country have been ordered to close down because of inability of the Authorities to provide police security.

The general production picture is therefore one of the maintenance of present outputs in the near future and a long term trend which, in the absence of the finding and exploitation of new reserves, will result in smaller supplies of tin from Malaya. Throughout the known tin bearing areas of the world the richer deposits are being steadily worked out, a process which was accelerated for others when the tinfields in this part of the world were in Japanese hands, and maintenance of the present outputs from most of them is dependent on ability to work lower grade deposits with more costly and intricate plant than was required previously.

With all the will in the world to produce enough tin to meet all demands it has not been possible to raise world production above 165,000 tons of metal per year. In periods of normal trade this quantity should suffice, and more than suffice, over a trade cycle, to meet the world's needs. In times like the present when there are exceptional demands of a precautionary defence nature from the industrialised countries the quantity has been shown to be insufficient and not unnaturally the price reacted accordingly. It rose rapidly last year as many users, encouraged by the fear that the South-East Asian tinfields would once again be denied to them, rushed for supplies after the outbreak of the Korean War.

The U.S.A. had by this time entered into agreements with Bolivia, Belgium and Indonesia for substantial quantities of tin and it is likely that by this means some 50,000 tons per year, much of it for stockpiling, were removed from the open market. It is therefore not surprising that the price for what was left for commercial consumption, then rapidly returning to normal after the removal of the war restrictions on use, climbed quickly from the artificial levels to which it had been held by the United Kingdom and United States Governments until the end of 1949.

Whilst I think that what I have said explains highly important factors which affected the price, it is my opinion that the American authorities then guiding tin policy were actuated by friendly and helpful motives, even if, quite naturally, self-interest made the foregoing agreements an acceptable policy. Tin rose in common with all other commodities and the rise does not seem to be out of balance with other commodities including those which have a great effect on the costs of production in the mining areas. It is not for me to guess what a fair price for tin should be, but responsible representatives of the Chinese mining community do not look on the present price as being other than fully justified by present costs of finding, equipping and working areas of current average ore content. The production from Chinese-operated mines amounts to over 40 per cent of Malayan production.

What the authorities in the U.S.A. have now done is to stop all commercial imports of metal and to create a State monopoly as bulk buyer. One of the first actions of the State was to cease all purchases of metal through the normal American commercial channels and, so far as can be judged, there has been no free trade with the U.S.A. since early this year.

Exports of Malayan smelter production to U.S.A. ceased in March when final deliveries against outstanding contracts were made to exporters.

I think it is a pity that U.S.A. policy has had to go to the lengths it has, but let us not blink the fact that with the diplomatic pressure it can and does exert on other nations to the harm of long established connections, its stockpile reserves and its powerful financial resources which enable it to continue buying tin above the price at which it sells to its own consumers, the American nation can carry on as at present for a long time to come.

It is easy for tempers to become frayed in such circumstances and for recriminations to issue which do not help towards mutual understanding but I am certain that good sense must ultimately prevail.

It is perhaps impossible to be accurate about what is true world consumption in a phase such as at present when world industrial activity is probably higher than it has ever been. It is generally accepted that on the average the world requires about 150,000 tons every year—some years more, some years less. A carefully compiled and well reasoned analysis which I saw sometime ago placed world prospective use at over 180,000 tons per year, but if that quantity were ever required it could not come from the present known sources of supply. From these indications of consumption it would seem most advisable that potential production should not be permitted to drop below the present figure of 165,000 tons. A 10 per cent margin over average use is little enough in any industry and, as I have suggested earlier, the present trend is for production to drop, or to be maintained only by further exploration and development of new areas.

CONSERVATION AND SUBSTITUTES

The last war forced the industrial countries who were cut off from the previous plentiful supplies to adopt methods of conservation in the use of tin and to look for substitutes which could displace it completely. Naturally these efforts met with some success, particularly in the U.S.A. where in regard to tin there is a somewhat coloured outlook which, judging by recent comments, tends in some less-informed quarters to verge on the irresponsible. The actions taken to conserve the metal during the war were right and proper and I have no doubt that industrial research encouraged by the American Government for strategic reasons, will continue to strive for means to make the U.S.A. less dependent on tin. We should be realistic about this not unnatural policy for them, and gain comfort from the fact that in spite of everything that has been done so far there is ample proof that tin still is an indispensable strategic metal.

It is indispensable for plenty of uses and the efforts of the Tin Research Institute to ensure the best utilization of the metal in its present applications and in developing the new uses which continue to be found should be encouraged and expanded. There is much to be done in this way and it is interesting to record that new Laboratories for the Institute will be opened by H.R.H. the Duke of Gloucester on May 31. We wish the Institute every success and hope that all Governments contributing to the cost of its operations will ensure that its efforts are not stultified for lack of necessary revenue.

There are some encouraging new uses which the Institute has fostered, and amongst those should be mentioned tin/zinc plating which is gaining in popularity because of the withdrawal of cadmium in U.S.A. for plating purposes. Another use is tin/nickel alloy plating, about which there is restrained optimism for the future. I have seen some of the automobile fittings which have been plated with this alloy and tried out in actual practice and there certainly seems to be an important potential demand where attractive finish and high resistance to atmosphere are required. The small example of this plating which is before you will, I am sure, bear this out. It has been exposed for the last two months in Singapore's humidity.

I have ventured to give you at some length a general picture of the world tin position, and it is worth recording the opinion that tin is still a vital metal, and that a most pressing problem of the not-so-distant future is the challenge to the producing countries to replace the reserves which are being steadily used up.

THE BALANCE SHEET

Turning now to the Balance Sheet the profit for the year amounted to \$1,446,087 and the Directors have felt justified in recommending an increase in the dividend to the pre-war rate. The return from our investments has of course helped considerably in achieving our results and we are sure you will approve our prudent recommendation to create an investment reserve out of current profits. Ore was economically treated at Pulau Brani, but rising costs can seriously affect the profitability of a business which we think still provides a cheap service for the complex work we do. It has always been our

policy to keep the smelting charge as reasonable, and to change it as infrequently, as possible but changes in all items of expenditure come with such size and rapidity nowadays that we have to keep the position under almost daily review if we are to keep abreast of them. Increases in our charges are inevitable under present conditions but we know our mining friends are fully aware from their own experiences of the current trend of rapidly rising costs.

Sundry Creditors and Credit Balances show an increase, principally due to the higher price of metal and this is also the cause of the greatly increased accommodation we have had to obtain from the Bank to finance our ore purchases.

On the Assets side, Works and Buildings and Furniture are nominally valued and Pulau Brani Leases have been written down at their usual rate against expiry. Investments in Subsidiary Companies remain unchanged and again the increase in amounts owing from them is represented by cash which it suits us to leave in London. Sundry Investments shows an increase due to minor changes in our holdings but principally to our interest in the Singapore Plywood Factory in association with two other companies. This up-to-date plant is now nearing completion and should be in production before the end of this year.

Tin and Tin ore in Stock and in transit and Stores Stock continue to be conservatively and safely valued. Sundry Debtors is a sound item and cash in hand requires no comment.

SUBSIDIARY COMPANIES

In regard to our subsidiary companies the British Tin Smelting Co., Ltd., continues to earn satisfactory profits but there has been considerable delay owing to shortage of materials in completing the extensions which were approved last year. The difficulties of obtaining plant and building materials have also affected us elsewhere in our business but we expect the extensions to the Liverpool plant to be completed before the end of the year. A scarcity of materials suitable for treatment will unfortunately delay our being able to take full advantage of the extensions.

Pelam Estate had a good year and in spite of labour shortage and adverse weather conditions, both of which prevented our obtaining maximum yields, demonstrated that it was capable of producing at low cost. The funds which derive from the Estate are of course managed by us and used in the best interests of our organization as a whole but we have thought it best not to transfer any profits by way of dividends in the meantime.

The Mining properties in Malaya and Thailand have provided disappointing results, particularly at Kampong Toh, in South Siam, where unexpected dredging difficulties arose which affected the small area left to dredge after crossing the main Yala/Betong Road. With the approaching exhaustion of the area the dredge will shortly be idle.

The dredge which we were given permission by the Thai Authorities to return to Malaya was finally transported before the end of last year, but erection had commenced before that. The pontoon was successfully launched on January 19, and we hope that the dredge will commence digging about three months hence. The rate of progress fell short of original expectations but, in view of the current delays in obtaining spare parts and the shortage of labour, is not abnormal.

In South Siam the necessary plant for a pilot mill for the Laboo mine was received last year and we hope that this experimental plant will shortly be operating.

Small areas in both countries continued to be worked by contractors but by the end of last year all but two of Malayan areas had been closed down for security reasons.

We continue our policy of careful development and so far this has been possible within the limits of the subsidiaries' own resources. The recent settlement of our Thai war claims should enable this policy to be continued for some time longer. An acute shortage of skilled and unskilled labour adds to our difficulties and our staff have had many disappointments to contend with under conditions which have been particularly trying. In Malaya there have been clashes between mine security personnel and the bandits and on Pelam Estate there have been both incidents and slashing of trees. The strain our staff is constantly under is a source of anxiety to us and we look to the time when safety will again return to this part of the world.

Some years before the war we became interested in the East African area as a possible increasing source of ore supply, and we have maintained an Agency there ever since. Our object was to provide the ready cash facilities which would encourage prospecting and development in the area and in this respect our action did help. We also took a majority interest in a small producing mine which, over the period, has proved profitable. Lack of communications prevented worthwhile development, but our progressive investigations and the likelihood that the Uganda Government will now open up the country by providing better communications, made it worth our while some months ago to send a mining engineer to go into the future of the property on the spot. The recommendation is that we should proceed with a programme of mechanization and initial steps have been taken to put this in train. The Colonial Development Corporation have also entered the field and have acquired mines from some of the local producers. The indications are that the East African field is not likely to be other than a small producer, but given a good price, a reasonably profitable future seems likely.

Before concluding my address I would remind you that last last year I referred to the possibility of some relief from U.K. Income Tax being available to stockholders. We have not yet reached the point of being able to circularize members on the subject as our negotiations are still in the preliminary stages. The subject is involved and it may take some time to reach a formula with the Tax Authorities but we shall do our best to make a suitable arrangement as expeditiously as possible.

TRIBUTE TO STAFF

I must also refer to the continued and loyal support we have had from the Staff and I am sure you will wish me to record how grateful we are for the help they have always given. I would particularly mention those who have carried out their duties in areas where danger is always present. Later on I will ask you to agree to a simple resolution which will empower the Directors to vary the rate of contribution to the Company's Provident Fund. The Fund was established over thirty years ago at the same time as a Superannuation Fund for locally engaged staff.

Conditions have altered since then, and it is most desirable that the Directors should have power to make such alterations in the conditions of service as they may from time to time consider appropriate. I commend the resolution for your approval.

The Report and Accounts were adopted.

OAKLAND

WANTED REGULARLY

SOLDER AND WHITE METAL (Scrap & Ashes)

BRASS SKIMMINGS

BRASS/COPPER RADIATORS of every description.

SCRAP LEAD CABLE

IRONY ALUMINIUM SCRAP

SCRAP ZINC

ZINC ASHES

SCRAP DIECAST ZINC

NICKEL IRON BATTERIES

NICKEL AND NICKEL ALLOY SCRAP

TUNGSTEN & MOLYBDENUM SCRAP

CADMIUM SCRAP

OAKLAND WORKS • WILLINGTON • DERBY

Telephone: REPTON 391 and 392

METAL COMPANY LIMITED

LONDON OFFICE: 94, New Bond Street, London, W.1

Telephone: GROsvenor 5241/4. Cables: AMOMET LONDON.

Telegrams: AMOMET WESDO LONDON.

JOHN SUMMERS & SONS LTD.

COMPANY'S CENTENARY PRODUCTION RECORDS BROKEN

The Annual General Meeting of John Summers & Sons Ltd. was held on Thursday last in Chester.

Mr. Richard F. Summers (Chairman) presided.

The following is an extract from the Chairman's Statement which was circulated with the report and accounts:—

Before giving an account of our activities during the year 1950 I should like to mention the fact that we are this year celebrating the centenary of our business, which was founded in 1851 by my grandfather, the late John Summers. We are naturally very proud of the great progress that has been made since the very humble beginnings, when clog irons, manufactured in a small room in Stalybridge, were our only product.

The success of our development—at whatever stage in the Company's history—could never have been accomplished without the loyal support of all engaged in the business, and without the spirit of comradeship which I know exists at Shotton; just as grandfather, father and son have in turn had the honour of being Chairman of the Company, so many other grandfathers, fathers and sons have, by their loyalty and example, made no small contribution to its success. I am naturally justly proud of what has been achieved and I should like to thank you all for your help. In these days it is neither wise nor easy to forecast the future, but I hope that the spirit of friendliness and high endeavour which has prevailed in these Works for so long may help to overcome whatever difficulties lie ahead.

PRODUCTION

It is very gratifying to me to be able to report that last year we again broke all our production records. The combined ingot production at Shotton and Shelton amounted to no less than 760,000 tons, which is 40,000 tons higher than the tonnage produced in 1949. On the hot mill we rolled 564,000 tons—almost 100,000 tons more than last year; 425,000 tons was cold reduced as against 350,000 tons in 1949, and deliveries of finished products to our customers attained the record figure of 564,000—an increase of 100,000 tons over the 1949 figure.

Turning now to the Accounts. The gross profit is very much the same as last year, in spite of the record production to which I have just referred, but 1950 was a year of rising costs in almost every direction, with no corresponding increase in the selling price of our products, and I feel in the circumstances that it is very satisfactory that our greater production and increased efficiency enabled us to maintain approximately the same figure of gross profit.

INITIAL ALLOWANCES

In the Directors' Report for 1949 it was explained that it was proposed to transfer the initial allowances on the capital expenditure in connection with our large development scheme, comprising the installation of coke ovens, blast furnaces, and a new melting shop, to a special reserve for deferred taxation, in order that the taxation charged in the Profit and Loss account each year would be more truly representative of the liability applicable to the trading profit that year. It will be noticed from the current accounts that the amount transferred to this special reserve amounts to no less than £600,000, with the result that the total amount charged against gross profit for taxation is very similar to the figure for 1949. We are satisfied that this is the most practical way of dealing with initial allowances, especially when they amount to such large sums. The announcement by the Chancellor of the Exchequer that these initial allowances are to be discontinued after April, 1952, will of course affect the Company's cash position, but it is hoped that by that date approximately two-thirds of the cost will have been met.

The full dividend for the year 1950 was paid on the Preference Shares, together with the amount due from January 1 to February 15, 1951, and the maximum dividend allowed under the Iron and Steel Act was paid on the Ordinary Stock for the same period.

DEVELOPMENT SCHEME

Last year in referring to the development scheme I mentioned that expenditure to date on the scheme was £1,127,095; during 1950 a further £2,774,706 was expended. Whilst very considerable progress has been made, the rate at which such schemes as this can be carried out to-day is very much slower than before the war, and deliveries of all types of machinery and equipment are still very protracted. We are, however, pressing on with the scheme as energetically as we can, with a view to bringing the new plant into operation at the earliest moment. Every effort is being made to keep the cost as low as possible, but this is not easy in view of the continually rising prices with which we are at present faced. In conclusion I should like to thank all employees of this Company and its Subsidiaries for their loyal support and co-operation during 1950, without which such satisfactory results could not have been achieved.

The report and accounts were adopted.

GOPENG CONSOLIDATED, LTD.

MR. STANLEY WICKETT'S REVIEW

The Thirty-Eighth Ordinary General Meeting of Gopeng Consolidated, Ltd., was held on May 25 at the Registered Office, Redruth.

Mr. Stanley Wickett (Chairman), presided.

The Report and Accounts for the year ended September 30, 1950, having been circulated for the prescribed time, were taken as read, as was also the Chairman's Statement, circulated with the report and accounts, which was as follows:

The Accounts for the financial year ended September 30, 1950, show a very satisfactory gross profit of £273,224, after paying the sum of £59,276 in Royalty and Tin Duty to the Malayan Government.

From the profit British taxation, at the rates ruling up to April 6, 1951, required the provision of £151,758, the sum of £10,000 was written off Leases and Mining Rights, £9,092 from the Pipeline and Equipment accounts and £10,000 was transferred to General Reserve.

Five Dividends, totalling 8s. 6d. per £1 Stock paid with respect to the year amounted to £92,511 and it is of interest to compare this figure with the company's contribution to the British and Malayan Governments which totalled £211,034 in estimated taxation, royalty and tin duty.

The advance received from the Malayan Government stands at the figure of £49,819 while at the close of the accounts expenditure carried forward in suspense on Rehabilitation account amounted to £93,361, included in the company's claim for War Damage. Assessment of the claim is awaited, but under the terms of an announcement made by the Malayan Government it appears that owing to limitation of funds compensation for damage suffered as the result of Japanese occupation will be drastically scaled down.

The General Manager's Report which is attached gives statistics and particulars of work at the mine. It will be noted that the exceptionally consistent water supply throughout the year enabled an increased yardage to be treated and produced an increase in output with a consequent reduction in the cost of production. The average price received for tin ore was approximately £52 per ton higher than that of the previous year.

Satisfactory progress was made with the earthwork for the Kampar Water Supply deviation. Both Moynaly and Sanglo Estates showed profits from rubber sales.

Since the commencement of the current financial year the quarterly outputs of tin ore have been:

October-December, 1950	3,385 piculs = 201½ tons
January-March, 1951	3,030 piculs = 180½ tons

These returns are in accordance with the General Managers' report that prospects for the current year are favourable provided that the more stringent emergency measures do not unduly affect the operation of the mine. In this connection I am happy to state that the Mines Department and Security Authorities have worked in close co-operation with the Management in implementing local measures necessary under the "Briggs Plan." Recent reports indicate that the practical steps being taken are commencing to make progress toward the restoration of law and order.

Although the danger and difficulties in Malaya under which tin production has been carried on during the past three years do not yet appear to be known in America—judging by recent ridiculous officially published statements—the position is now fully understood in England, and I again express our appreciation of the characteristic pluck and efficiency of our General Managers, the Staff at our Mine and Estates, and of their wives, who have so nobly played their part, and also of the Asian labour force.

Your Directors have authorized the payment, at the discretion of the General Managers, of a special Gratuity with respect to the calendar year 1950 of two months salary to members of the Staff at the Mine and Estates, and with this I am confident Stockholders will heartily agree. In addition the Staff participate in the Malayan Tin and Rubber Provident Fund, and a Pension Scheme.

The Statement of Accounts and Balance Sheet, together with the Directors' Report, were received and adopted.

The meeting concluded with a vote of thanks to the Chairman for his able conduct of the company's affairs.

DIVIDENDS

Anaconda Copper 75c.
Bank of Australasia 10% (July 9)
Barclays Bank (D.C. & O.) 4% (June 15)
Kramat Tin Dredging 20%
Frontino Gold 7½%
Lyndhurst Deep Level 5% (July 11)
Mount Isa Mines 10% (June 29)
Union Bank of Australia 10% (July 9)

Topical News in Brief

New Zealand's Hot Springs for Power.—Dr. O. P. Bergelin, Professor of Chemical Engineering, Delaware University, U.S.A., is, according to Reuter, to advise the New Zealand Government how to harness underground steam and heat at Rotorua and other places in North Island.

Boliden Co.'s Large Reserves.—The Boliden Mining Co., which recently celebrated its 25th anniversary, reports that the copper, silver and other ores available will suffice for at least another three decades. The company employs 4,000 persons at present.

Canadian Mining Tax Exemptions Extended.—The Canadian Budget, presented on April 10, by the Minister of Finance, Mr. Abbott, extended for another year tax deduction on exploration expenses for oil, mining and natural gas companies, and extended to mines starting production in 1953 and 1954, a three year tax exemption.

Electrification of Australian Railway Line into Coalfields.—Contracts worth £14,500,000 have been placed in Britain, Germany, America and Canada for rolling stock and traction power for the electrification of the railway between Parramatta and Wallerawang, according to the New South Wales State Transport Minister, Mr. M. Sheahan.

British Insulated Callenders Construction Co., according to Reuter, has been awarded a £3,000,000 contract to electrify the portion between Parramatta and Lithgow. The work will enable electric stock to proceed to Lithgow in the heart of the western coal field area.

Sweden to Build Iron Powder Factory.—A sponge iron factory is to be built in Keeping, Central Sweden, by the Hoeganaes Iron Works, Central Sweden, to help meet the increased demand for iron powder in Sweden and other countries, particularly the U.S. In addition, the company is also to build a factory in the United States for the manufacture of iron powder directly from iron-ore.

A New Industrial Mineral.—Wollastonite, a new industrial mineral, is now being used in wall and floor tiling, in welding electrode coatings and in soil dressings according to R. B. Ladoo (*Eng. Min. J.*, 151, No. 11, 95, 1950). Wollastonite is a calcium silicate which occurs interlayered with a red-brown andradite garnet. The flow sheet of the Willsboro Mining Company, which is given, shows a 75 per cent recovery of calcium silicate and a 10 per cent recovery of garnet.

Italian Workers for British Coalmines.—Agreement has been reached between the Ministry of Labour and National Service and the National Coal Board with the Italian Government for the recruitment of Italian men for underground coalmining in this country. Interviewing has begun and parties are expected to arrive weekly. Each volunteer will be medically examined in Italy. Transport will be arranged for the volunteers by the Ministry; they will come from Italy to a National Coal Board English Instruction Centre, where they will become the Board's responsibility.

Important Rhodesian Chrome Deal.—An important transaction was completed recently between the owners of big Rhodesian chrome ore deposits and representatives of the Vanadium Corporation of America. It is understood that the amount involved in the transfer is more than £500,000. The claims involved lie in the Darwendale and Concession areas along the great dyke. As a result, nearly all the known chrome resources in Africa are now controlled by two concerns—the Chrome Trust of Rhodesia and the Rhodesian Vanadium Corporation.

The Colony is likely to be called upon to meet a large part of the demand for metallurgical chrome for the arms drive, and it is hoped that the introduction of such a large amount of American capital into a Rhodesian venture will result in an improvement of transport facilities.

Progress at Arncliffe Opencast Site.—In spite of difficulties caused by wet weather, good quality coal is now being produced from the lower of three seams at the opencast site at Arncliffe, Midlothian, opened last November by the Taylor Woodrow Construction Co. It is expected to yield 450,000 tons of coal over a period of three years. A 350-ton Diesel-electric "walking excavator" which is now being erected on the site, is expected to begin operating in May when 3,000 to 4,000 tons should be produced weekly. It took 35 15-ton lorries to convey the massive mechanism to Arncliffe from Monmouthshire where it had been engaged on similar opencast work. It is operated by a crew of five.

The method of working is to strip and stock 12 in. of top-soil and 3 ft. of sub-soil for replacement after the coal has been won. The stripping is done by tractors and scrapers and, when completed, a drag-line excavator removes the overburden down to the coal which is then lifted by mechanical shovels. Finally, the coal is conveyed five miles, where it is screened and washed.

HARMONY GOLD MINING CO. LTD.

(Incorporated in the Union of South Africa)

NOTICE OF EXTRAORDINARY GENERAL MEETING

NOTICE IS HEREBY GIVEN that an Extraordinary General Meeting of Harmony Gold Mining Co. Ltd. will be held in the Board Room, Second Floor, The Corner House, Johannesburg, at 10 a.m. on Friday, June 29, 1951, for the purpose of considering and, if thought fit, of passing with or without modification the following resolution as an Ordinary Resolution, namely:—

"That the Directors be and they are hereby authorized, in pursuance of Article 58 of the Company's Articles of Association, from time to time at their discretion to raise or borrow or secure the payment of any sum or sums of money for the purposes of the Company, but so that the amount owing in respect of moneys so raised, borrowed or secured, shall not exceed the amount of £2,000,000."

The Transfer Books and Register of Members will be closed from June 23, 1951 to June 29, 1951, both days inclusive.

BY ORDER OF THE BOARD

London Office: A. MOIR & CO.
4 London Wall Buildings, E.C.2. London Secretaries.
May 30, 1951.

W. E. SINCLAIR, M.I.M.M.

Consulting Mining Engineer
South & East Africa & Rhodesia
P.O. Box 1183. JOHANNESBURG

FOR SALE RAILS FLAT BOTTOM

150 tons 70 lb. per yard. 5½ in. base. 40-45 ft. lengths. Suitable for pit-prop, shoring or constructional work. Low price. Pike Brothers, Private Sidings, Colnbrook, Bucks. Telephone: 175.

FOR SALE RAILS BULLHEAD

300 tons 95 lb. per yard. 35-60 ft. lengths. Suitable for relaying, pit-props, shoring or constructional work. Low price. Pike Brothers, Private Sidings, Colnbrook, Bucks. Telephone: 175.

INVESTIGATIONS & MANAGEMENT LTD.,

Technical Consultants to
THE NANWA GOLD MINES LTD, SILVERMINES
LEAD & ZINC CO., LTD.

and other mining companies, are continually requiring mining staff of all grades. Apply to Secretary, Finsbury House, Blomfield Street, London, E.C.2, giving record of service, references, etc.

PLANT FOR DISPOSAL IN IRELAND

The following SURPLUS PLANT is available in Ireland, subject to prior sale and would be disposed of on very advantageous terms for a quick sale.

1. One Semi-Diesel Engine by Petters Ltd., Ipswich, 4 cylinder, 2 stroke cycle, 300 h.p. at r.p.m. 260.
 2. One Semi-Diesel Engine by Petters Ltd., Ipswich, 4 cylinder, 2 stroke cycle, 250/275 h.p. at 275 r.p.m.
- N.B.—This engine has not been run since fitted with new pistons and liners by the makers. Date 1920.

The above are available for Inspection in Ireland. Please make enquiries or offers direct to:—

The Secretary,
Silvermines Lead & Zinc Co., Ltd.,
Silvermines,
Nenagh, Co. Tipperary, Ireland.

Metal and Mineral Trades

THE BRITISH METAL CORPORATION LIMITED.

HEAD OFFICE
PRINCES HOUSE, 93 GRESHAM STREET, LONDON, E.C.2
Tel. Monarch 8055

AND AT
17 SUMMER ROW, BIRMINGHAM
Tel. Central 6441
47 WIND STREET, SWANSEA
Tel. Swansea 3166

OVERSEAS ASSOCIATES

THE BRITISH METAL CORPORATION
(AUSTRALIA) PTY., LIMITED
SYDNEY, PERTH AND MELBOURNE

THE BRITISH METAL CORPORATION
(CANADA) LIMITED
MONTREAL

DREW, BROWN LIMITED,
MONTREAL

THE BRITISH METAL CORPORATION
(INDIA) LIMITED,
CALCUTTA AND BOMBAY

THE BRITISH METAL CORPORATION
(SOUTH AFRICA) (PROPRIETARY) LTD.
JOHANNESBURG

C. TENNANT, SONS AND CO.,
OF NEW YORK,
NEW YORK

CONSOLIDATED TIN SMELTERS, LIMITED.

PRINCES HOUSE, 95 GRESHAM STREET, LONDON, E.C.2

Telephone: MONarch 7661/3

Telegrams: CONSMELTER, PHONE LONDON

PROPRIETORS OF THE FOLLOWING BRANDS OF LAMB & FLAG AND STRAITS TIN

ENGLISH
(COMMON & REFINED)

**CORNISH
MELLANEAR
PENPOL**

STRAITS E. S. COY., LTD., PENANG

BUYERS OF ALL CLASSES OF TIN ORES

Sole Selling Agents: VIVIAN, YOUNGER & BOND, LIMITED

8 BASINGHALL STREET, LONDON, E.C.2

Telephone: MONarch 7221/7

IN ORES, CONCENTRATES, SLAG and BY-PRODUCTS

GOLD

We are SMELTERS and REFINERS.

Please send full particulars and samples:

SILVER

DERBY & Co. Ltd. 62-63 Cheapside, London, E.C.2

SMELTING and

(Established 1797)

PLATINUM

REFINING WORKS: BRIMSDOWN (near London) Middlesex

Telegrams: PLATIVET, LONDON.

Telephone: CITY 2633

Cable Address: WAHCHANG, NEW YORK

WAH CHANG CORPORATION

(FORMERLY WAH CHANG TRADING CORPORATION)

233 BROADWAY

NEW YORK 7, NEW YORK

TUNGSTEN TIN

BUYERS

Tungsten Concentrates, Tungsten Tin Concentrates
Mixed Tungsten Ores
Tungsten Tailings, Scrap, Tips, Grindings
Tin Concentrates—Tin Dross, Tin Furnace Bottoms

SELLERS

Tungsten Concentrates to Buyers' Specifications
Tungsten Salts, Tungsten Powder
Tungsten Rods and Wires
Tin Ingots, Tin Oxides, Tin Chlorides

PLANT—GLEN COVE, NEW YORK

THE BRITISH TIN SMELTING COMPANY LIMITED

English Refined Tin

"HAWTHORNE" Brand

W. E. MOULSDALE & CO., LTD.

General Agents

2 CHANTREY HOUSE, ECCLESTON STREET, LONDON, S.W.1

THE STRAITS TRADING Co. Ltd. SINGAPORE

Straits Refined Tin

"Straits Trading Co. Ltd." BRAND

Correspondents in U.K.

W. E. MOULSDALE & CO., LTD.

2 CHANTREY HOUSE, ECCLESTON STREET, LONDON, S.W.1

GEORGE T. HOLLOWAY & CO. LTD.

METALLURGISTS & ASSAYERS,
ORE TESTING, WORKS AND
METALLURGICAL RESEARCH LABORATORIES

Atlas Road, Victoria Road, Acton,
LONDON N.W.10

Telephone No.:
ELGAR 5202

Tels. & Cables:
NEOLITHIC LONDON

THE ANGLO METAL COMPANY LIMITED

2 & 3, CROSBY SQUARE,
LONDON, E.C.3

(Members of the London Metal Exchange)

NON-FERROUS METALS
ORES & CONCENTRATES
BULLION

Telephone:
LONDON WALL 6341
(Private Branch Exchange)

Telegram:
NUCLIFORM PHONE
LONDON

Cables: NUCILFORM, LONDON

Telegrams:
"BASSETT, PHONE, LONDON."

Telephone:
MANSION HOUSE 4401/3.

BASSETT SMITH & Co. Ltd.

(Incorporating George Smith & Son)

15/18 LIME ST., LONDON, E.C.3

METALS,

ORES (Copper, Zinc, Lead, &c., Complex),
RESIDUES, SKIMMINGS & ASHES
NON-FERROUS SCRAP

A. STRAUSS & CO. LTD.

FOUNDED 1875

37-39 LIME STREET, LONDON, E.C.3

Telephone: Mansion House, 8276

MERCHANTS, EXPORTERS, IMPORTERS

NON-FERROUS METALS
SCRAP RESIDUES

METAL REFINERS

Members London Metal Exchange

ESTABLISHED 1869
**BLACKWELL'S
METALLURGICAL WORKS LTD.**
THERMETAL HOUSE, GARSTON, LIVERPOOL, 19

MAKERS OF
FERRO ALLOYS, NON-FERROUS ALLOYS,
RARE METALS

BUYERS AND CONSUMERS OF
COLUMBITE, TANTALITE, TUNGSTEN
MANGANESE and all ORES.

Works, Garston:

Telegrams: Blackwell, Liverpool.

EVERITT & Co. Ld.

40 CHAPEL STREET
LIVERPOOL

Telegr. Address: Persistent, Liverpool

Phone: 2995 Central

SPECIALITY

MANGANESE PEROXIDE ORES,

We are buyers of:—
WOLFRAM, SCHEELITE, MOLYBDENITE
VANADIUM, ILMENITE, RUTILE,
ZIRCONIUM and TANTALITE ORES

Suppliers of:—

FERRO-ALLOYS & METALS NON-FERROUS ALLOYS

THE ANGLO CHEMICAL & ORE COMPANY LIMITED

PALMERSTON HOUSE, BISHOPSGATE, LONDON, E.C.2

Importers and Exporters MINERALS · ORES · RESIDUES · CHEMICALS · NON-FERROUS METALS & SCRAP

TELEPHONE: LONDON WALL 7255 (5 lines)

TELEGRAMS: CHEMORE

Consult
JOHN DALE
LIMITED

about Aluminium Alloy
Gravity Die Castings

DEPT. TS 7, LONDON COLNEY, ST. ALBANS, HERTS.
Telephone: London Colney 3141

**The Commercial Smelting
and Refining Co. Ltd.**

MACKINTOSH LANE, HOMERTON, LONDON, E.9

Manufacturers of
**Gunmetal, Bronze, Brass and White-
metal Ingots to all Standard Specifications**

Buyers of
Scrap Metals and Metallic Residues

Telephone: Amherst 5446 (3 lines) Telegrams: Metsmelt, Hack London

RHONDDA METAL CO. LTD.

1 HAY HILL, BERKELEY SQ. LONDON, W.1
Works: PORTH, GLAM.

**PHOSPHOR COPPER
SILICON COPPER MANGANESE COPPER
ALL NON-FERROUS ALLOYS**

Telephone: MAYFAIR 4654 Cables: RONDAMET

LEOPOLD LAZARUS LIMITED

Creechchurch House, LONDON, E.C.3
(Also at BIRMINGHAM and MANCHESTER)

Telegraphic Address: Orminiat, London

Buyers of:
NON-FERROUS SCRAP, ORES AND RESIDUES
Sellers of:
SEM-MANUFACTURED NON-FERROUS METALS

Telegrams:
NONFERMET
TELEX, LONDON

Cables:
NONFERMET
LONDON

Telephone:
MANSHION HOUSE 4521
(10 lines)

**HENRY GARDNER
& CO. LTD.**

Non-Ferrous Metals
Ores, Minerals & Residues
Rubber
General Merchandise

**2 METAL EXCHANGE BUILDINGS
LONDON, E.C.3**

and at BIRMINGHAM, MANCHESTER and GLASGOW

CUPELS

MAGNESIA CUPELS and ASSAY MATERIAL
"MABOR" BRAND, as supplied to MINTS,
MINES and ASSAYERS throughout the World.

MABOR (1944) LIMITED
(Founded 1900)

THE PIONEERS OF MAGNESIA CUPELS
Registered Office: 310 Winchester House, London, E.C.2
Phone: London Wall 5089 Tel. Address: Maborlim, Lndn
Agencies: SALEM, INDIA: MONTREAL, CANADA:
PERTH, W.A.

Supplies through Agents, the Trade, or direct.

NORDISCHES ERZKONTOR G.M.B.H.

Beckergrube 38,
LUEBECK (Germany)
Telephones: 2 59 81
Cables: Erzkontor

Postschiessfach 41,
LUENEN/LIPPE (Germany)
Telephones: 28 54
Cables: Erzkontor

Sellers of
HUETTENWERK KAYSER LUENEN G.M.B.H.
PRODUCTS

**ORES-METALS-METAL-ALLOYS
SCRAP METALS-RESIDUES**

ALFRED HARRIS & Co. (Richmond) Ltd.
FOR ALL SCRAP METALS

Specialities:—
NICKEL MOLYBDENUM TUNGSTEN
MANOR PARK, RICHMOND, SURREY Phone: 0028/9

P. & W. MACLELLAN LTD.
129 TRONGATE, GLASGOW

**NON-FERROUS METALS all classes
INGOT SCRAP MANUFACTURED**

Letters: P.O. Box 95 Glasgow
Telegrams: Maclellan, Glasgow Telephone: Bell 3403 (20 lines)

METAL TRADERS LTD.

7 Gracechurch Street, LONDON, E.C.3

New York Representative:
Metal Traders Inc., 67 Wall Street

Buyers and Sellers of

**NON-FERROUS METALS
ORES AND MINERALS**

TEL. ADDRESS:
SROLOATEM, STOCK, LONDON

TELEPHONES:
MANSION HOUSE
7275-7276-7277

BROOKSIDE METAL CO. LTD.

(Owned by Metal Traders Ltd.)

Honeypot Lane, STANMORE, Middx.

Buyers and Sellers of

**ALL NON-FERROUS SCRAP METALS
Specialists in ALUMINIUM**

TEL. ADDRESS
ALUMINUM, STANMORE

TELEPHONES:
EDGWARE 1646-1647

S. J. BARNETT & Co. Ltd.

DERBYSHIRE HOUSE,
BELGROVE STREET, LONDON, W.C.1
Telephone: Terminus 3154

ORES - METALS - RESIDUES**MINING & CHEMICAL PRODUCTS, LTD.****MANFIELD HOUSE, 376, STRAND, W.C.2**

Telephone: Temple Bar 4511/3 Works: ALPERTON,
Telegrams: "MINCHEPRO, LONDON" WEMBLEY, MIDDLESEX

*Buyers of Silver Ores and Concentrates**Smelters and Refiners of***BISMUTH****ORES, RESIDUES & METAL***Manufacturers of:*

**FUSIBLE ALLOYS, SOLDER, WHITE METALS
ANODES OF TIN, CADMIUM and ZINC IN
ALL SHAPES**

Importers and Distributors of:

**ARSENIC · BISMUTH · CADMIUM
CAESIUM SALTS · INDIUM · SELENIUM
TELLURIUM · THALLIUM**

**The Mining Journal
1951
ANNUAL REVIEW
NUMBER**

**Summarizes events and statistics
of 1950**

Is now on Sale

- Orders for copies should be placed direct, or through Newsagents.
5s. 0d. post free.

Write: The Publisher, Mining Journal,
15 George Street, London, E.C.4

COMPLEX**& LOW GRADE****MATERIALS***

are treated on

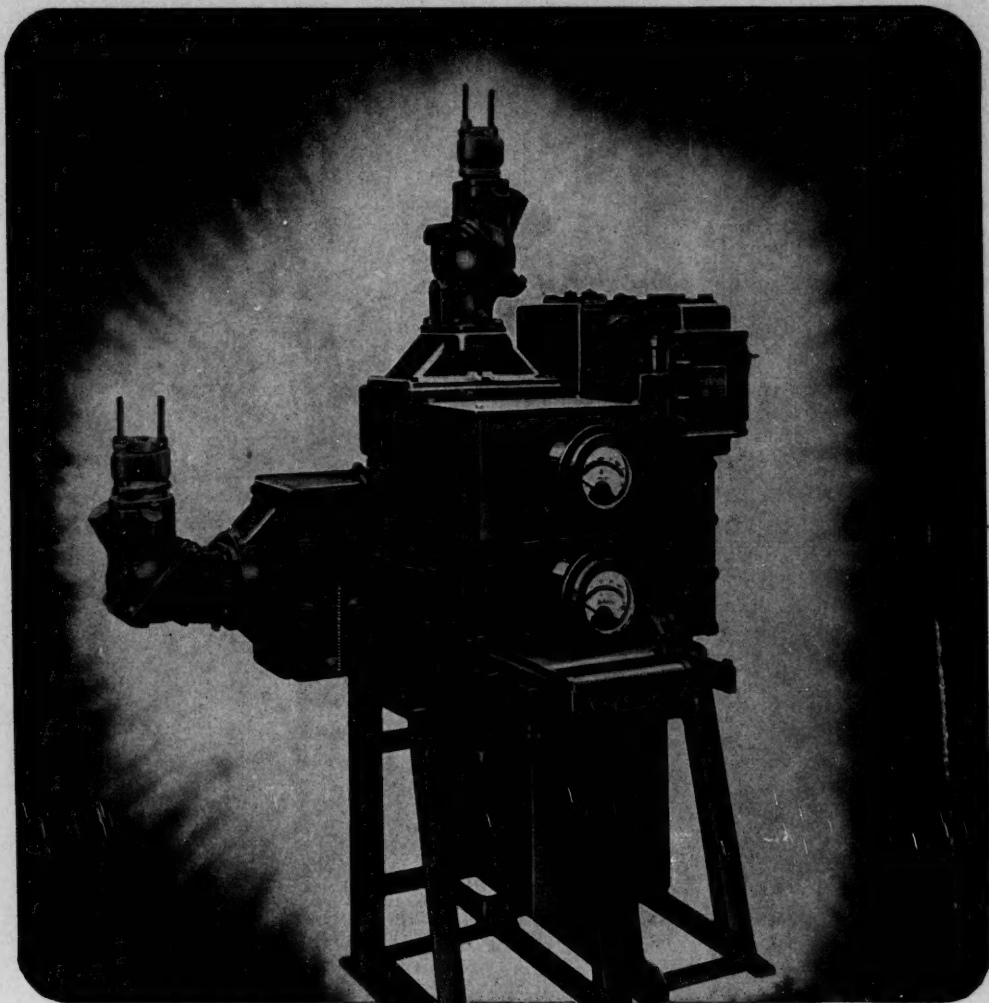
toll or bought

outright by

Capper Pass

- * containing principally TIN
and/or LEAD whether free.
from or combined with any
of the metals
COPPER, ANTIMONY,
BISMUTH and SILVER

Send Samples to them at
P.O. Box 237 BRISTOL ENGLAND



*Flameproof Unit Type SF
fitted with flameproof
lighting transformer.*

FLAMEPROOF SWITCHGEAR type SF

for use in mines, oil refineries and
sites subject to explosive atmospheres.

Up to 3.3-kV.

Fully "Buxton" certified • Rating: 150-amps to 400-amps • Breaking capacities up to 25 MVA at 400-volts, up to 50 MVA at 3.3-kV • Cable boxes, detachable after sealing, adjustable for cable entry from any direction.

METROPOLITAN-VICKERS ELECTRICAL CO. LTD.

MANCHESTER 17, ENGLAND

Member of the A.E.I. group of companies

F/M901